TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477
Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

Phase (check one)	Type (check one)
✓ Site Investigation	☐ Work Scope
☐ Corrective Action Feasibility Investigation	✓ Technical Report
☐ Corrective Action Plan	☐ PCF Reimbursement Request
☐ Corrective Action Summary Report	☐ General Correspondence
☐ Operations & Monitoring Report	

SUPPLEMENTAL SITE INVESTIGATION
June 18, 1997

Mount Mansfield Garage
Route 100 and Route 108
Stowe, Vermont

SMS Site # 90-0630
TSEC Project # 97-031

Facility Owned By:
Mr. Bob Chase
Mt. Mansfield Garage
Route 100
Stowe, VT 05672
(802) 253-7530

Written By:

Jon P. Berntsen
Staff Geologist

Reviewed By:

John R. Diego
Vice President

Kenneth J. Bisceglio
Technical Director

TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477
Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

June 18, 1997

Mr. Robert Chase
Mt. Mansfield Garage
Route 100
Stowe, Vermont 05672

RE: Supplemental Site Investigation
Mt. Mansfield Garage - Stowe, Vermont
SMS Site #90-0630, TSEC Project #97-031

Dear Mr. Chase,

Enclosed is the Supplemental Site Investigation Report which was prepared to further evaluate subsurface conditions apparently resulting from the on-SITE storage and distribution of petroleum products.

Seven (7) permanent monitoring wells were installed on SITE, along with four (4) temporary monitoring wells, and three (3) soil borings. Groundwater samples collected from the wells were tested for volatile organic compounds (VOCs), and total petroleum hydrocarbons (TPH) as gasoline.

Data returned from these analyses, along with field observations, indicate that significant petroleum-related contamination has impacted soil and groundwater beneath the SITE. There are also noticeable releases of petroleum to adjacent surface waters.

We have recommended that the SITE enter into an emergency corrective action program that will focus on the immediate clean-up of petroleum contamination in soil and groundwater beneath the SITE. A quarterly groundwater monitoring program has also been recommended.

Please call to discuss our findings or other matters of concern.

Sincerely,
TWIN STATE ENVIRONMENTAL CORPORATION

Jon P. Berntsen
Staff Geologist

cc: Mr. Bruce Linton, Sites Management Section
Mr. Skip Vallee, R.L. Vallee, Inc.

Mt. Mansfield Garage
Stowe, Vermont
June 18, 1997

1.0 INTRODUCTION

This report has been prepared by Twin State Environmental Corp. (TSEC) under agreement with the SITE owner, Mr. Robert Chase, to present the findings of our recent supplemental site investigation (SSI) at the above referenced SITE (see SITE Location Map, **Figure 1**). This SSI was requested following the discovery of petroleum sheens on the adjacent stream during a Phase I Environmental Site Assessment (ESA). The Phase I ESA was conducted by Envirosense, Inc. (Envirosense) of Londonderry, New Hampshire, following the request of a party interested in purchasing the SITE. TSEC provided field support services for the Phase I ESA under the direction of Envirosense.

Additionally, following the discovery of petroleum sheens, TSEC implemented a groundwater sampling episode of existing wells on-SITE and on the adjacent Bourne's Texaco SITE (SMS# 92-1246). This work was requested by the State of Vermont Sites Management Section (SMS) and performed on behalf of Mr. Chase. A report was prepared summarizing the data and was submitted with recommendations for the SSI. A copy of this report is attached in **Appendix A**.

During the initial investigation in April 1997, a total of seven (7) permanent monitoring wells, four (4) temporary monitoring wells, and three (3) soil borings were installed to evaluate the condition of the groundwater and soils beneath the SITE. Several surface water monitoring points were also established to monitor the hydrology and water quality of the stream bordering the western edge of the SITE. Wells at the adjacent Bourne's Texaco SITE were also monitored. For locations, see SITE Plan, **Figure 2**.

Based upon field observations and chemical analyses performed by Endyne, Inc. of Williston, Vermont (Endyne), there is evidence of significant petroleum-related contamination present in soil and groundwater beneath the SITE. There is also a visible and quantifiable impact to surface water, as was evidenced by the release of a product sheen from the east bank of the stream during the spring months, and results of a laboratory sample collected from the stream surface.

2.0 SCOPE OF SERVICES

The following scope of services were performed by TSEC during these investigations:

- Subsurface investigations performed included the installation of seven (7) permanent groundwater monitoring wells, and three (3) soil borings, using Geoprobe® direct push technology. Soil samples collected from the boreholes were field screened for volatile organic compounds (VOCs) using a ThermoEnvironmental Instruments Organic Vapor Meter (OVM) with a photoionization detector (PID) equipped with a

10.6 eV lamp. A jar headspace method was employed to liberate the volatile components from the soil.

- Four (4) temporary monitoring wells were installed using Geoprobe® hand tools along the stream to monitor the groundwater quality adjacent to the stream. No soil samples were collected during the installation of these wells.

- Monitoring wells associated with the SITE were sampled for VOCs via US EPA Method 8020 and TPH as gasoline by US EPA Method 8015M. Analyses were performed by Endyne.

- Four (4) groundwater monitoring wells previously installed at Bourne's Texaco were also sampled for VOCs and TPH.

- Three (3) surface water samples were collected from the stream along the western edge of the SITE and analyzed for VOCs and TPH via US EPA method 602 and US EPA Method 8015M respectively.

- Monitoring wells, soil borings, stream elevation monitoring points, and pertinent structural features were surveyed by TSEC for location and relative elevation, and are incorporated onto the SITE Plan (see **Figure 2**, SITE Plan).

- A summary report of the above-mentioned Scope of Work was prepared and is presented herein.

3.0 SITE LOCATION AND DESCRIPTION

SITE Owner:	Mr. Robert Chase
Address:	Route 100 Stowe, Vermont
Zoning:	Commercial
Utilities:	Water - Municipal Connection (from Rt. 100) Sewer - Municipal Connection Electricity - overhead connection Telephone - overhead connection
Structures:	One (1) two-story garage building, housing an automotive repair business and retail gasoline operation, one (1) unoccupied three (3) story building, and two (2) gasoline and diesel pump dispenser islands.

The SITE is located on the northern side of Route 100 (Main Street), at the intersection of Route 108 (Mountain Road) in Stowe, Vermont (see SITE Location Map, **Figure 1,** and SITE Plan, **Figure 2**). There are two (2) structures present on the SITE, both of considerable age.

The SITE is in a commercially zoned area. The SITE is bordered along the northwest by a stream that runs from Sunset Hill to Little River. The south and east sides of the SITE are bordered by Route 100 and Route 108 respectively.

Currently, there are four (4) underground storage tanks (USTs) present at the SITE, with a total capacity of 31,000 gallons. There is one (1) tank each for regular, plus, and super-grade gasoline, and a two (2) chambered tank for the storage of kerosene and diesel fuels. The pumps, piping, and USTs were all installed in 1990.

The topography of the SITE is fairly flat on the southern portion of the SITE, with a slight slope to the north. Along the western edge of the SITE, the land surface slopes steeply to the stream, approximately 20 feet below.

4.0 UST CLOSURES ON SITE

Under the direction of SMS, ten (10) USTs were excavated and removed from the SITE between November 27 and November 29, 1990. Soils beneath a 4,000 gallon gasoline UST, and soils found in an excavation for five (5) USTs located adjacent to a former pump island, were all reported to contain VOCs at concentrations above 200 ppm as measured by a PID. The condition of the tanks was not reported.

Approximately 150 to 170 cubic yards of petroleum-contaminated soil was excavated and removed from the SITE for stockpiling. Groundwater was not encountered during the excavation of the former USTs; however, petroleum sheen was evident in three (3) places along the above mentioned stream.

5.0 SUBSURFACE EXPLORATION AND RESULTS

This subsurface exploration program was developed to gather data to supplement a previous subsurface investigation conducted by TSEC and Envirosense, and to provide a better understanding of the hydrogeology and contaminant distribution on SITE.

5.1 Advancement of Soil Borings

A total of ten (10) soil borings were advanced using a Geoprobe® on April 9 and May 23, 1997 by TSEC in locations indicated on **Figure 2**. Seven (7) of these borings were converted into permanent monitoring wells. Logs for these borings are presented in

Appendix B. These borings were advanced to depths ranging from 12 to 24 feet below ground surface (ft bgs). All borings were logged, describing soil strata conditions, and field screened with the PID.

General soil conditions encountered at the SITE consisted of silty sands and gravel overlying gray silt. Groundwater was encountered at approximately 10 to 13 ft bgs. Contaminated soil was encountered during the installation of all borings, with the exception of boring B-4. Contamination was encountered at all depths. **Table 1** summarizes the PID headspace screening results obtained during boring installation. A headspace analysis performed on several of these samples indicated VOCs present at concentrations greater than 1,500 parts per million volume (ppmv).

5.2 Monitoring Well and Soil Boring Installation

TSEC installed seven (7) small diameter pre-packed monitoring wells on SITE during the investigation; five (5) on April 9, 1997 (MW-101, MW-102, MW-103, MW-105, and MW-107), and two (2) on May 23, 1997 (MW-109, and MW-110). Four (4) temporary monitoring wells (MW-111, MW-112, MW-113, and MW-114) were installed along the stream on May 23, 1997. Three (3) soil borings were also advanced during the investigations. The wells and borings were installed in the following locations and are depicted on the SITE Plan, **Figure 2**.

- Monitoring Well MW-101 was installed on the northern portion of the property;
- MW-102 was installed in the apparent downgradient (north) direction of the existing kerosene tank;
- MW-103 was installed adjacent to Route 108, along the eastern edge of the property;
- B-4 was completed to the east of the existing pump island, adjacent to Route 108;
- MW-105 was installed between the existing three story building and the pump island along Route 100;
- B-6 was completed between the south pump island and Route 100;
- MW-107 was installed between the south pump island and the stream along the western edge of the SITE;
- B-8 was completed in front of the Stowe Water and Light building, on the south side of Route 100;
- MW-109 was installed between the Stowe Water and Light building and the stream, also on the south side of Route 100;
- MW-110 was installed at the southwest corner of the Mt. Mansfield Garage building;
- MW-111 was installed adjacent to the northwest corner of the Mt. Mansfield Garage, and along the stream;

- MW-112 was also installed adjacent to the northwest corner of the Mt. Mansfield Garage;
- MW-113 was completed to the north of the Mt. Mansfield Garage, along the stream; and,
- MW-114 was installed adjacent to the southwest corner of the Stowe Water and Light building.

Further details of the monitoring wells are presented below and in **Appendix B**: Monitoring Well and Boring Logs. Well locations are depicted on **Figure 2**, SITE Plan.

5.2.1 Monitor Well Construction

The newly installed permanent monitoring wells are constructed of 1½ x ½-inch diameter schedule 40 polyvinylchloride (PVC) pre-packed monitoring wells with 0.010-inch machine slotted screen. These pre-packed monitoring wells consist of a ½-inch diameter inner screen surrounded by a clean sand filter pack, placed inside a 1½-inch diameter outer screen, and a ½-inch diameter schedule 40 PVC riser. A bentonite seal is placed above the 1½-inch diameter pre-packed screen, and the well is sealed with a locking expansion plug and a curb box set in concrete that is flush grade. The depths of the wells range from 5.5 to 12.0 ft bgs.

The temporary wells are constructed of a 1-inch diameter schedule 40 PVC well with a 0.010-inch machine slotted screen.

5.3 SITE Geology and Hydrogeology

A summary of the predominate geological units encountered during drilling activities indicated silty sands and gravel overlying gray silt. According to the SITE owner, a majority of the SITE is comprised of fill material. Native materials were encountered at approximately 10 ft bgs. Along the southwest portion of the SITE, there is an engineered slope consisting of large boulders adjacent to the stream. This feature is approximately 15 ft high.

In several of the borings, a silty layer approximately ½-foot thick was encountered around 10 ft bgs. This layer is characteristic of a wind-blown silt deposit, due to its relatively loose configuration. **Figure 3** is a geologic cross section of the SITE depicting this silt layer, along with water table elevation and PID readings observed during headspace screening.

The majority of the western portion of the SITE slopes steeply down to the edge of the stream. There is an area along the northwest corner of the building that is flat and low

lying, adjacent to the stream. Monitoring wells MW-111 and MW-112 have been installed in this area, and separate phase gasoline has been observed in MW-111.

Groundwater was encountered during drilling between 10.0 and 13.3 ft bgs. It appears that the groundwater is situated below the silt layer. For a more detailed description of geological units see Monitoring Well and Boring Logs, **Appendix B**.

5.3 SITE Survey

A Topcon AT-G6 auto level was used to perform a stadia survey to identify the location of the newly installed monitoring wells and borings with respect to existing SITE features. Several surface water monitoring points were also surveyed for elevation and location. The collected data was used to update the SITE Plan (**Figure 2**) and include the location of the newly installed wells. A bolt on the Mobil sign in front of the building (south side) was used as a benchmark, and was given an assumed elevation of 100 feet. There were several instrument set points.

6.0 SAMPLING ACTIVITIES

Groundwater sampling was performed at this SITE by TSEC on May 30, 1997. Samples were collected from on-SITE and associated monitoring wells MW-1, MW-101, MW-103, MW-105, MW-107, MW-109, MW-110, MW-112, MW-113, and MW-114. Monitoring wells MW-111 and MW-102 both exhibited greater than 1/8 inch of free product, and MW-2 and MW-3 did not contain sufficient water and were thus not sampled. Wells MW-1, MW-2, and MW-3 were previously installed by others during tank replacement activities in 1990. These wells, all 4 inches in diameter, are between 11.0 and 12.7 feet deep.

Monitoring Wells TW-1, TW-2, TW-3, and TW-4, located on Bourne's Texaco, were surveyed, gauged, and sampled for VOCs. Three (3) stream samples, designated S-1, S-2, and S-3 were also collected. Additionally, during the drilling of boring B-8 on May 30, 1997, it was not possible to place a permanent groundwater monitoring well due to difficult subsurface conditions. Gravel and cobbles from fill material were obstructing the boring at approximately 5 ft bgs. A groundwater sample was collected from boring B-8 using a Screen Point® sampler advanced using a Geoprobe®. All samples were submitted to Endyne for analysis of VOCs by US EPA Method 8020 for groundwater samples and US EPA Method 602 for surface water samples, and by US EPA Method 8015M for TPH.

Prior to sampling, depth to groundwater measurements were made in all of the wells. Depth to water ranged from 2.50 to 13.51 ft bgs at wells MW-114 and TW-3 respectively.

To allow for a representative groundwater sample, each well was purged of three (3) volumes of water with a new disposable bailer or low flow peristaltic pump. The groundwater sample collected from B-8 using the Screen Point® sampler was obtained by using a *Waterra*® check valve on the bottom of poly tubing. Purge water from the wells was discharged directly to the ground surface. Sampling at each location was conducted using a new bailer. Bailers were dedicated to each well for future sampling events.

Stream samples were collected by immersing a 40 ml clear glass vial into the stream. The bottle was allowed to fill almost completely. Acid was added to the bottles, and the remainder of the bottle was filled using water collected in a clean 40 ml vial.

Quality Assurance/Quality Control (QA/QC) samples incorporated into this sampling round included one (1) duplicate sample, taken from monitoring well MW-101. The sample, labeled DUP-1, was analyzed via US EPA Method 8020 for VOCs and US EPA Method 8015M for TPH. All chemical analyses for this round of groundwater sampling were performed by Endyne. The results of the groundwater sampling round are discussed in the following sections. Full analytical results are presented as **Appendix C**.

7.0 RESULTS OF SAMPLING ACTIVITIES

7.1 Groundwater Flow Direction

Groundwater levels on SITE were measured by TSEC personnel on May 30, 1997. As previously mentioned, depth to groundwater ranged from 2.50 to 13.51 ft bgs at wells MW-114 and TW-3 respectively. A full analysis of groundwater elevation data is presented in **Table 1** (Groundwater Elevation Data).

Based on measured depths to groundwater observed in monitoring wells on-SITE at the time of sampling, groundwater underlying the SITE has been calculated to flow generally to the northwest in the overburden aquifer. A graphical interpretation of the groundwater elevation data is presented on the Water Table Elevation Map provided as **Figure 4**.

According to published hydraulic conductivity values for mixed sand and gravel, similar to the subsurface materials encountered at the SITE, the hydraulic conductivity, K, for the aquifer ranges between 0.28 feet per day (ft/d) and 28 ft/d (Fetter, 1994). Under the site hydraulic gradient of 0.045 ft/ft, and using an average porosity of 25% for mixed sand and gravel, the calculated apparent groundwater flow velocity beneath the site ranges from 0.05 ft/d to 5.0 ft/d.

7.2 Analytical Results

VOC results received from Endyne indicate that petroleum compounds are present in ten (10) of the sampled monitoring wells: MW-101, MW-103, MW-107, MW-107, MW-109, MW-110, MW-112, MW-113, TW-1, and TW-4. The surface water sample collected at S-2 also contained BTEX compounds and MTBE. The complete analytical laboratory report from Endyne is provided as **Appendix C** and summarized as **Table 2**, Summary of Groundwater Quality. Graphical representations of the BTEX, MTBE, and TPH distributions across the SITE are presented as **Figures 5, 6 and 7**.

Benzene, toluene, ethylbenzene, and total xylenes (BTEX) and MTBE are all present above their respective Maximum Contaminant Levels (MCLs) for BTEX and Vermont Health Advisory (VHA) level for MTBE in monitoring wells MW-101, MW-103, and MW-107. With the exception of MW-109 and TW-2, all of the wells with detectable concentrations of VOCs exceeded the MCL for at least one of the BTEX compounds or the VHA for MTBE.

Surface water sample S-2 contained benzene at 22.8 micrograms per liter (ug/l), above the MCL of 5 ug/l. TPH values in groundwater range from less than 100 ug/l in several samples to 158,000 ug/l in the sample collected from MW-103. TPH in surface water ranged from less than 100 ug/l at S-1 and S-3, to 650 ug/l at S-2.

The sample from boring B-8 that was collected on May 23, 1997, also exhibited BTEX compounds and MTBE, but at levels below the MCLs and VHA. This sample was not analyzed for TPH.

Analyses of samples collected from monitor wells MW-1, MW-114, and TW-3, as well as surface water samples S-1 and S-3, were returned with concentrations below the detection limits of laboratory instrumentation for both analytical methods. Monitoring wells MW-111 and MW-102 both contained free product, resembling gasoline.

7.2.1 QA/QC Results

The relative percent difference (RPD) calculated for BTEX compounds present in MW-101 is 7.8%. The RPD calculated for MTBE is 1.4%, and the RPD for TPH is 13.6%. Generally, an RPD of less than 25% is considered acceptable. Analysis of the field blank indicated that all target compounds were below method detection limits.

8.0 RECEPTOR EVALUATION

During the investigation, downgradient receptors were identified, and those with potential for impact from the on-SITE contamination were investigated for the presence

of petroleum related contamination. Downgradient receptors identified include the hill slope leading to the stream, the stream, Little River, and ultimately the Waterbury Reservoir. The basement of the Mt. Mansfield Garage was also inspected for the presence of petroleum contamination.

As previously mentioned, three (3) surface water samples were collected from the stream and analyzed for VOCs by US EPA Method 602, and for TPH as gas by US EPA Method 8015M. The results of these analyses, presented in **Appendix C**, indicate that the stream has been impacted. Surface water sample location S-2 contained 85.3 ug/l of total BTEX. However, BTEX concentrations at S-3 (downgradient monitoring point) were not present above method detection limits. Therefore, it does not appear that Little River and the Waterbury Reservoir are being directly impacted. Additionally, no noticeable vapors were present in the basement of the Mt. Mansfield Garage.

9.0 SUMMARY AND CONCLUSIONS

Based upon information and analytical data collected during this scope of work, TSEC concludes the following:

- Petroleum compounds are being released to the stream along the western edge of the property.

- There is free phase product present in two (2) of the on-SITE groundwater monitoring wells (MW-102 and MW-111).

- Groundwater enforcement standards are in exceedance for BTEX and MTBE over a vast majority of the SITE. Some locations exhibit concentrations over 2,000 times allowable levels (benzene at 13,400 ug/l in MW-103).

- The contamination present at Bourne's Texaco appears to be residual contamination from the release that was recorded at that SITE in 1992. It does not appear, based on the current data and information that the contamination at the Bourne's SITE is a major contributor to contamination present at Mt. Mansfield Garage.

- During the on-SITE UST closures in 1990, the tank cavity areas were excavated, and sheens were observed in the stream adjacent to the property. The initial site investigation in 1990 focused solely on the tank cavities and the stream. No detailed investigations of the areas between the tank cavities and the stream were undertaken until April of 1997.

  Therefore, residual contamination from the previous USTs is likely contributing to the concentrations detected in this water quality monitoring event. Based on the

presence of free product and high contaminant concentrations in groundwater proximate to the current UST systems, a new release may have occured.

10.0 RECOMMENDATIONS

Based upon current SITE conditions, TSEC recommends that this SITE be entered into an emergency corrective action program.

- All petroleum related equipment (i.e.-tanks, lines, sumps, product dispensers) should be tested and inspected to determine tightness.

- A quarterly monitoring program should be implemented at the SITE. This program should include all SITE groundwater monitoring wells associated with the SITE (MW-1, MW-2, MW-3, MW-101, MW-102, MW-103, MW-105, MW-107, MW-109, MW-110, MW-111, MW-112, MW-113, and MW-114), in addition to well TW-4 on the Bourne's Texaco SITE. Samples should be analyzed for VOCs by US EPA Method 8020. Surface water samples should also be collected at points S-1, S-2, and S-3 and analyzed for VOCs by US EPA Method 602. This quarterly program should be designed so that the stream can be sampled three (3) times a year (i.e.- sample only once while stream is frozen).

- In terms of performing remedial measures, two (2) areas have been established based on their locations and potential remedial measures to be applied (see **Figure 8**). One (1) location is to the south and east of the Garage Building (AREA 1); the other is near the northwest corner of the Garage Building (AREA 2).

  AREA 1 is characterized as having impacted soils (>1,500+ ppmv) near and below the water table (see **Figure 3**, Cross Section A-A') with a relatively extensive clean vadose zone ranging from 10 to 15 ft bgs; AREA 2 is located in a low lying flat area at the base of the embankment adjacent to the stream with a depth to water of less than 2 ft. Separate-phase product (approx. 0.25") has been identified in both areas in wells MW-102 and MW-111.

  In addition, intermittent sheens have been observed at the edge of the stream just west of well MW-107. This embankment is very steep and has been engineered/constructed with fairly large blocks of stone that forms the eastern border of the stream in this location. Cleanup directly along the stream bank is not feasible in this area.

  Groundwater has been found to flow to the north with a slight radial component to the west and potentially to the northeast. The stream that passes to the west of the SITE flows into Little River which flows about 3.5+/- miles to the south into

Waterbury Reservoir. The stream bank is being impacted by at least AREA 1 and most likely to some extent by AREA 2. Due to the high energy nature of the stream and Little River, impact to the reservoir under current conditions is not expected to occur.

Due to the high levels of impact to the soil and groundwater at the SITE, remedial measures should be undertaken to reduce impact to the local and regional environment. Locally, AREA 2 exhibits the greatest impact to human and ecological receptors. AREA 1 is comprised of a bulk mass of impacted soils within the water table which will continue to leach towards the stream. In terms of remedial measures, AREA 1 is more traditional due to it's subsurface nature, and AREA 2 poses unique engineering measures due to it's relationship to the embankment and stream.

Since both areas are close to the stream and have high soil and groundwater concentrations, natural attenuation will not provide attenuation of the source from impacting the stream. Based on the current SITE conditions, impact to the stream is expected to occur for many years. There is an insufficient buffer of land and organic matter between the source and stream to adsorb and biologically assume the contamination.

Due to the fast track nature of this project, the following remedial measures are provided as a basis of conversation between the SITE owner, State and TSEC.

AREA 1 would be amenable to vapor extraction and air sparging if there were more of an impacted vadose zone and the lithology above and below the water table were homogeneous. Unfortunately, the vadose zone is relatively clean and the lithology is basically sand with a 1/2 ft silt layer at 10 ft bgs +/- just above the water table. This silt layer may act as a confining layer that could significantly impact the effectiveness of vapor extraction and air sparging. Below the silt layer and water table, sand extends to a more appreciable silt deposit at 20 ft bgs +/-. The area between 10 to 20 ft bgs, predominately under the water table, was found to be impacted with high levels of contamination and sheens. Also, separate-phase product was encountered that would likely pose a contaminant spreading problem due to the uplifting properties of air sparging combined with vapor extraction.

Since there is a numerous number of underground items such as electric, leak detection, fire suppression, product and vent piping, the use of horizontal drilling was considered to avoid trenching through the utilities. The cost of horizontal drilling for air sparging and vapor extraction wells would have been in excess of $60,000.00. The SITE access is limited for this technology and also sparging and vapor extraction do not appear to be the remedial technologies appropriate for the SITE at this time.

Currently there are very high levels of impact into the silt encountered at 20 ft bgs. Since the sand and silt layers result in a significant difference in soil structure (heterogeneous formation) that is impacted with levels >2,000+ ppmv, further investigation into this layer will need to be engaged prior to implementing remedial measures. Further investigation would be proceeded as soon as possible (**ASAP**) with corrective action in mind and would be implemented using hollow-stem auger technology. It is anticipated that five (5) additional wells will be needed. These wells should be located near MW-101, MW-105, MW-110, to the north of MW-101, and across Rte. 108 to the northeast of MW-101.

Due to the presence of separate-phase product, high levels of soil and groundwater impact, and heterogeneities in the soils in AREA 1, the most effective remedial measure that would not facilitate further migration of contamination, would be a dual-phase extraction system (DPES). A DPES conceptually removes three (3) phases of contamination in the subsurface that are subsequently separated above ground. Vacuum is applied at levels between 10 to 20 inches of mercury below the water table to recover impacted groundwater, separate-phase product and gasoline adsorbed to the soils. Further consideration of this remedial measure would be evaluated following additional SITE characterization.

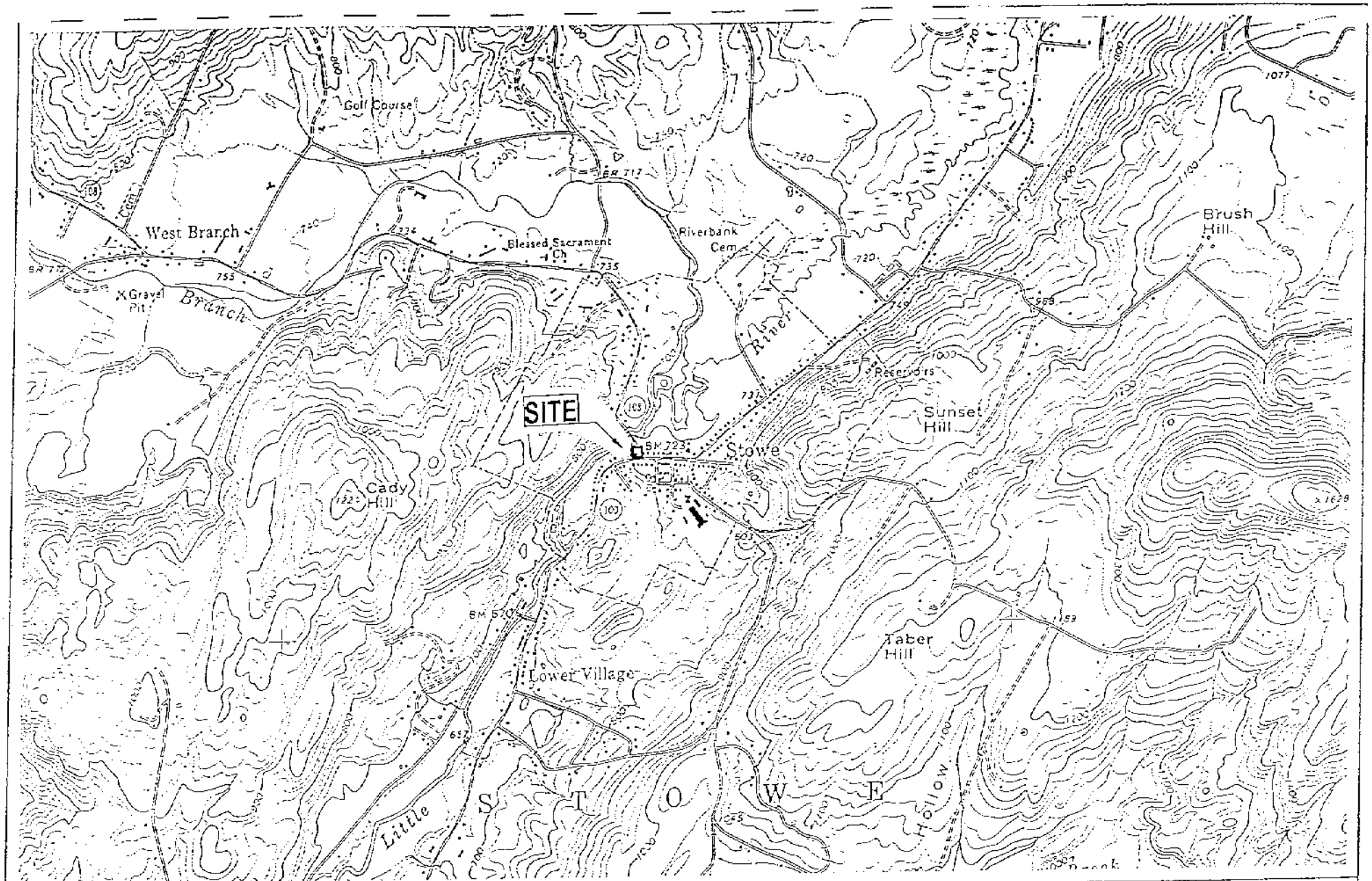
In AREA 2 near MW-111, an interceptor trench and dug recovery well could be installed to facilitate recovery of free product. Initially a passive product recovery system could be installed in the recovery well to recover product. If it appears that significant product is being recovered, then an automated recovery system could be installed. Work down in this area could be performed using a track-mounted excavator that could be potentially power winched down the embankment. TSEC would have to meet on SITE with an excavation firm to discuss this option. Prior to engaging into this activity, further study of the horizontal and vertical impact and hydrology of AREA 2 is required. Characterization could be performed using hand tools to collect samples followed by the installation of several piezometers.

As an interim measure, TSEC can install an adsorbent boom system in the stream bed to capture any sheens or floating product should it occur.

Finally, as observed by a TSEC remedial engineer during a SITE visit on June 17, 1997, petroleum odors were observed at the stream near the southeastern portion of the bridge crossing the stream along Rte. 108. This area is about 115 ft+/- northeast of MW-101 and may be impacted by petroleum being released from AREA's 1 and 2 or the storm drainage from Rte. 108. Nonetheless, further reconnaissance of the river bank should be performed using a hand auger to collect soils and a PID instrument used to screen for VOCs. Due to the high moisture content of these sediments to be

tested, samples would not be heated above 70°F. This would allow the jar headspace to be filled with VOCs while reducing the amount of water vapor that can cause false positive readings with a PID. Any samples found to have levels above 2.0 ppmv would be sent for laboratory analysis.

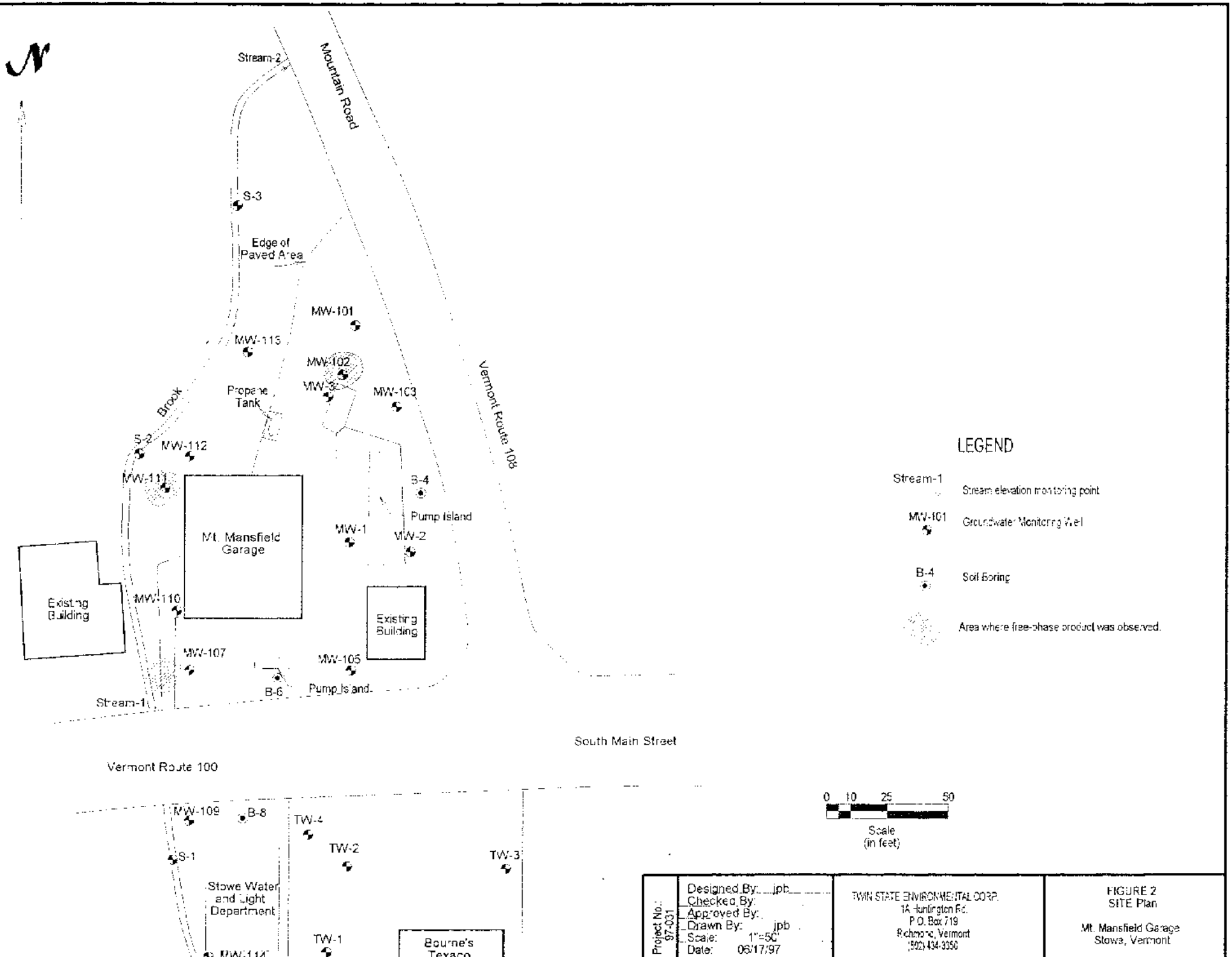
FIGURES

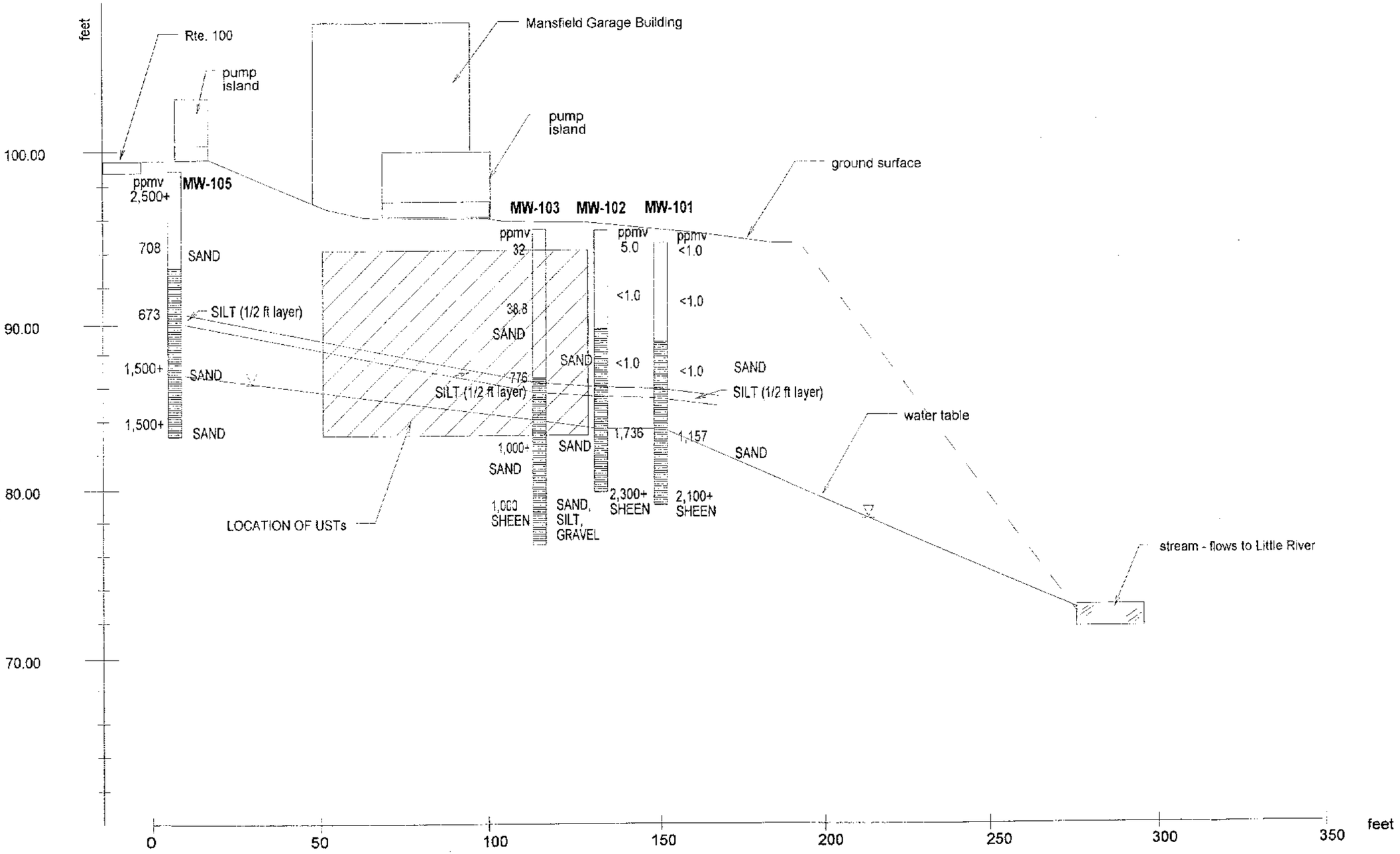


Project No: 97-031	Designed By: pb Checked By: Approved By: Drawn By: pb Scale: as shown Date: 6/27/97	TRAN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3360

FIGURE 1
SITE LOCATION MAP

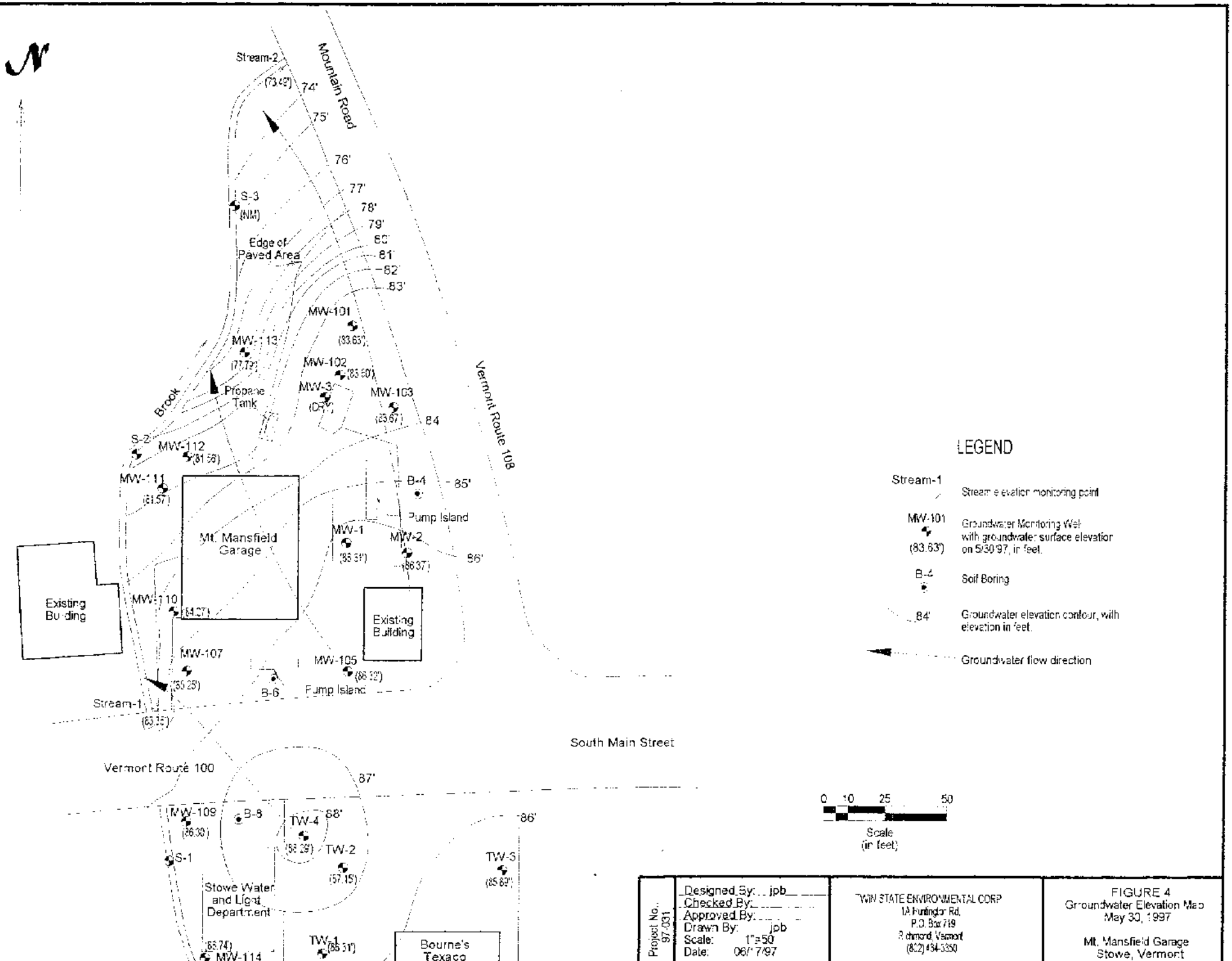
Mt. Mansfield Garage
Stowe, Vermont


N
Stream-2
Mountain Road
S-3
Edge of Paved Area
MW-101
MW-115
MW-102
MW-3
MW-103
Propane Tank
Brook
Vermont Route 108
S-2
MW-112
MW-111
B-4
Pump Island
Mt. Mansfield Garage
MW-1
MW-2
Existing Building
MW-110
Existing Building
MW-107
MW-105
B-6
Pump Island
Stream-1
South Main Street
Vermont Route 100
MW-109
B-8
TW-4
TW-2
TW-3
S-1
Stowe Water and Light Department
TW-1
Bourne's Texaco
MW-114
LEGEND
Stream-1
Stream elevation monitoring point
MW-101
Groundwater Monitoring Well
B-4
Soil Boring
Area where free-phase product was observed.
0 10 25 50
Scale (in feet)
Project No.: 97-031
Designed By: jpb
Checked By:
Approved By:
Drawn By: jpb
Scale: 1"=50'
Date: 06/17/97
TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-3350
FIGURE 2
SITE Plan
Mt. Mansfield Garage
Stowe, Vermont



kjb:\project\97031mg\csaa.skd

Project No: 97031	Designed By: kjb Approved By: Drawn By: kjb Scale: as shown Date: 06/18/97 Revised:	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 05477 (802) 434-3360	FIGURE 3 Cross Section A - A' Mansfield Garage Stowe, Vermont

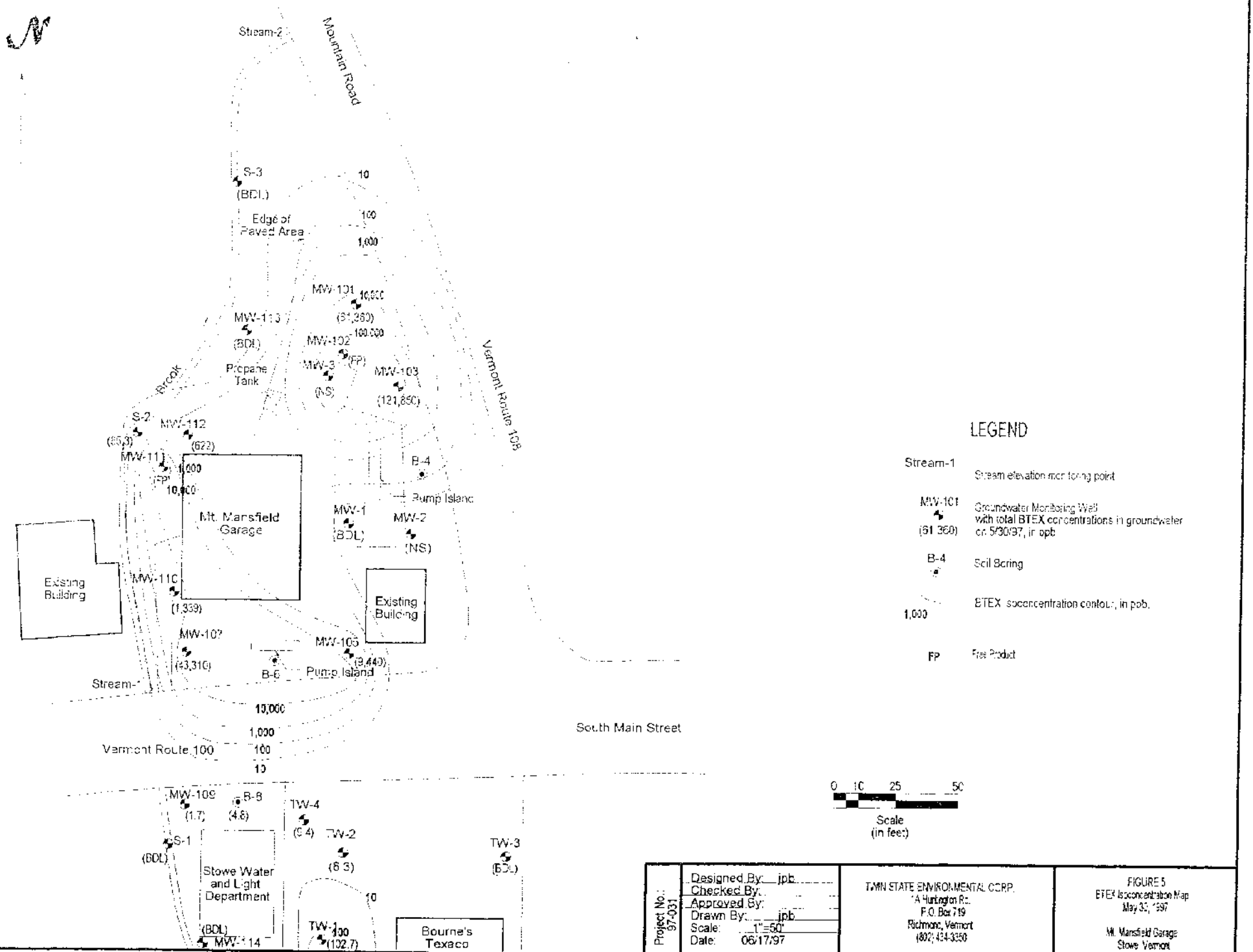


Project No.: 97-031	
Designed By: jpb	
Checked By:	
Approved By:	
Drawn By: jpb	
Scale: 1"=50'	
Date: 06/17/97	

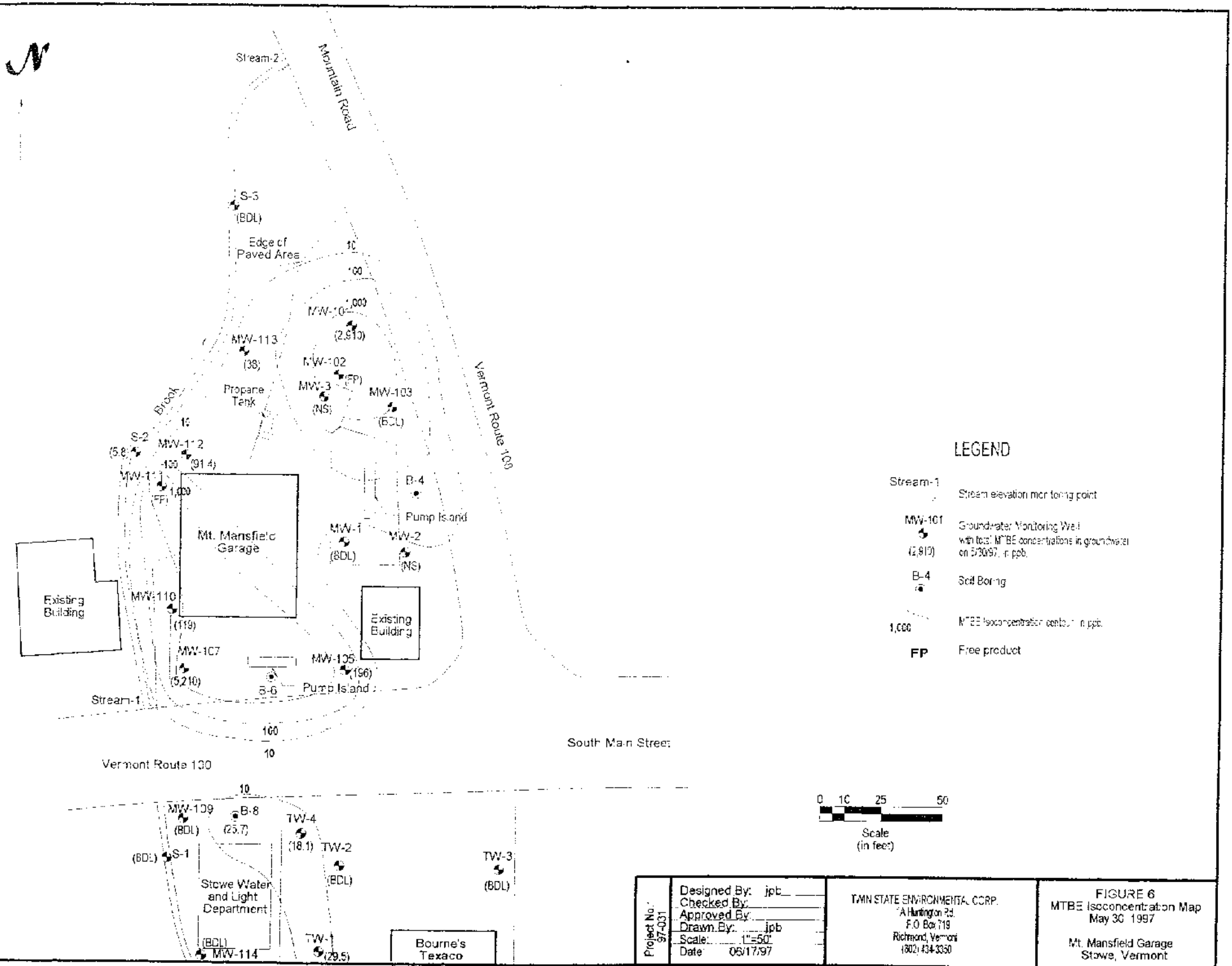
TWIN STATE ENVIRONMENTAL CORP
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-3350

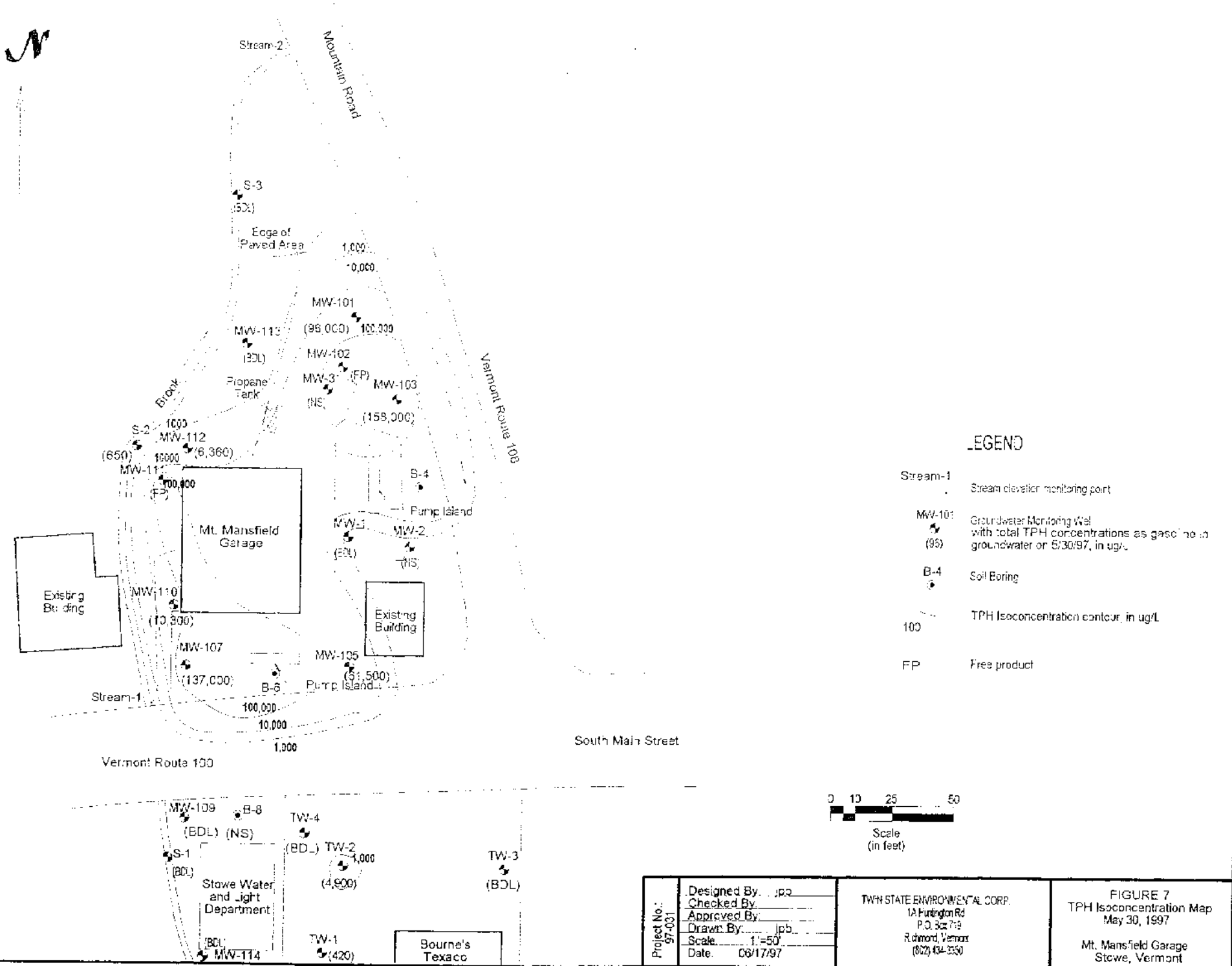
FIGURE 4
Groundwater Elevation Map
May 30, 1997

Mt. Mansfield Garage
Stowe, Vermont

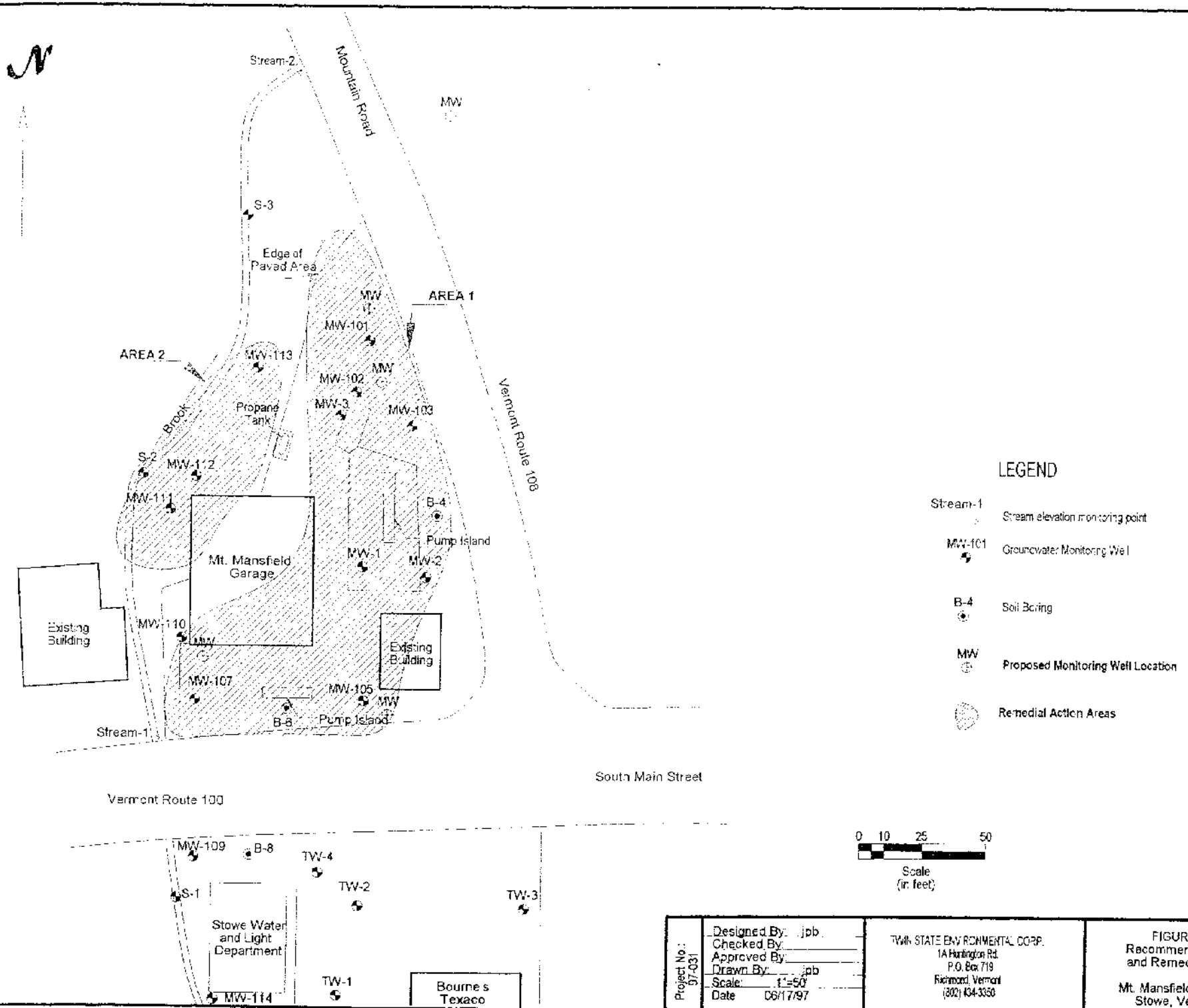


Project No.: 97-031	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 06/17/97	TWIN STATE ENVIRONMENTAL CORP. 1 A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 5 BTEX Isoconcentration Map May 30, 1997 Mt. Mansfield Garage Stowe, Vermont


N
Stream-2
Mountain Road
S-5
(BDL)
Edge of Paved Area
10
100
1,000
MW-104
(2,910)
MW-113
(38)
MW-102
(FP)
MW-3
(NS)
MW-103
(BDL)
Propane Tank
Brook
10
S-2
(5.8)
MW-112
(91.4)
100
MW-111
(FP)
1,000
Mt. Mansfield Garage
B-4
Pump Island
MW-1
(BDL)
MW-2
(NS)
Existing Building
MW-110
(119)
Existing Building
MW-107
(5,210)
MW-105
(196)
B-6
Pump Island
Stream-1
100
10
Vermont Route 100
Vermont Route 100
South Main Street
10
MW-109
(BDL)
B-8
(25.7)
TW-4
(18.1)
TW-2
(BDL)
(BDL)
S-1
TW-3
(BDL)
Stowe Water and Light Department
(BDL)
MW-114
TW-1
(29.5)
Bourne's Texaco
LEGEND
Stream-1
Stream elevation monitoring point
MW-101
(2,910)
Groundwater Monitoring Well with total MTBE concentrations in groundwater on 5/30/97, in ppb.
B-4
Soil Boring
1,000
MTBE Isoconcentration contour in ppb.
FP
Free product
0 10 25 50
Scale (in feet)
Project No.: 97-031
Designed By: jpb
Checked By:
Approved By:
Drawn By: jpb
Scale: 1"=50'
Date: 06/17/97
TMN STATE ENVIRONMENTAL CORP.
4 Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-3350
FIGURE 6
MTBE Isoconcentration Map
May 30, 1997
Mt. Mansfield Garage
Stowe, Vermont



Project No.: 97-031	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date: 06/17/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 7 TPH Isoconcentration Map May 30, 1997 Mt. Mansfield Garage Stowe, Vermont



Project No.: 97-031	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1"=50' Date 06/17/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 8 Recommendations and Remedial Plan Mt. Mansfield Garage Stowe, Vermont

TABLES

TABLE 1

HEADSPACE FIELD SCREENING SUMMARY

Mount Mansfield garage
Stowe, Vermont

April, 9 and May 23, 1997

Sample ID	Depth, ft bgs					
	0 - 4	4 - 8	8 - 12	12 - 16	16 - 20	20 - 24
	Concentration, ppmv					
MW-101/B-1	<1.0	<1.0	<1.0	1,157	2,100+ (SHEEN)	ns
MW-102/B-2	5	<1.0	<1.0	1,736	2,300+ (SHEEN)	ns
MW-103/B-3	32	39	776	1,000+	1,000+ (SHEEN)	ns
B-4	3.0	<1.0	3.0	<1.0	ns	ns
MW-105/B-5	2,949	708	673	1,500+	1,500+	ns
B-6	nc	363	1,000+	1,000+	1,000+	ns
MW-107/B-7	11	12	52	452	358	ns
B-8	<1.0	<1.0	<1.0	571	29	ns
MW-109/B-9	<1.0	<1.0	<1.0	13	2.8	nt
MW-110/B-10	nt	12	790	1,500+	1,500+	1,500+

Notes:

1. *ppmv - parts-per-million volume.*
2. *Volatile organic compounds measured with a Thermo Environmental Instruments Model 580B photoionization detector (PID) with a 10.6 eV lamp. The instrument was calibrated with an isobutylene standard, and a quality control check sample was also tested to ensure the accuracy of the data.*
3. *nt - not tested*
4. *ns - not sampled.*

kjb:\project\97023mgt\stab.wb1\aprmay97

TABLE 2

SUMMARY OF GROUNDWATER ELEVATIONS

Mount Mansfield Garage
Stowe, Vermont

May 30, 1997

Well Identification	Top of Riser Elev.	Depth to Product	Depth to Water	Depth of Well	Product Thickness	Water Column Thickness	Water Table Elev.
MW-1	97.28	ND	10.97	12.68	ND	1.71	86.31
MW-2	97.11	ND	10.74	10.99	ND	0.25	86.37
MW-3	96.11	ND	DRY	11.27	ND	NA	NA
MW-101	94.93	ND	11.30	16.30	ND	5.00	83.63
MW-102	95.55	12.05	12.07	16.00	0.02	3.93	83.48
MW-103	95.57	ND	11.90	18.95	ND	7.05	83.67
MW-105	98.67	ND	12.35	15.49	ND	3.14	86.32
MW-107	98.14	ND	12.89	18.00	ND	5.11	85.25
MW-109	97.96	ND	11.66	16.20	ND	4.54	86.30
MW-110	97.62	ND	13.35	23.20	ND	9.85	84.27
MW-111	85.97	4.40	4.42	6.40	0.02	1.98	81.55
MW-112	88.95	ND	7.39	10.00	ND	2.61	81.56
MW-113	86.31	ND	8.52	10.00	ND	1.48	77.79
MW-114	89.24	ND	2.50	7.80	ND	5.30	86.74
Stream-1	85.56	ND	2.21	NA	ND	NA	83.35
Stream-2	74.52	ND	1.03	NA	ND	NA	73.49
TW-1	98.85	ND	12.95	15.20	ND	2.25	85.90
TW-2	99.73	ND	12.58	15.35	ND	2.77	87.15
TW-3	99.40	ND	13.51	19.55	ND	6.04	85.89
TW-4	100.36	ND	12.07	18.60	ND	6.53	88.29

Notes:

Elevation data are referenced to a TBM and are in units of feet.
ND - Not detected.
NA - Not applicable.
Measurements recorded are referenced to a marking on top of PVC riser for each well.
Depth to fluid measurements were obtained using a Solinst Interface Probe.

jpb.\project\97-017nh\wettab.xls\April18,1997

TABLE 3

SUMMARY OF GROUNDWATER QUALITY

Mount Mansfield Garage
Stowe, Vermont

May 30, 1997

Test	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	MTBE	TPH
Sample ID	Concentration, ug/l						
MW-1	<1	<1	<1	<2	--	<2	<100
MW-2	NS	NS	NS	NS	NS	NS	NS
MW-3	NS	NS	NS	NS	NS	NS	NS
MW-101	***10,200***	***32,200***	***2,560***	***16,400***	61,360	***2,910***	96,000
MW-102	FP	FP	FP	FP	FP	FP	FP
MW-103	***6,650***	***70,900***	***5,600***	***38,700***	121,850	<2,000	158,000
MW-105	***695***	***2,730***	***765***	5,250	9,440	***196***	61,500
MW-107	***13,400***	***15,700***	***2,310***	***11,900***	43,310	***5,210***	137,000
MW-109	1.7	<1	<1	<2	1.7	<2	<100
MW-110	282	56.4	69.8	931	1,339	***119***	10,300
MW-111	FP	FP	FP	FP	FP	FP	FP
MW-112	***205***	42.6	52.8	322	622	***91.4***	6,360
MW-113	<1	<1	<1	<2	--	38	<100
MW-114	<1	<1	<1	<2	--	<2	<100
TW-1	***47.5***	10.5	9.3	35.4	102.7	29.5	420
TW-2	<1	<1	<1	8.3	8.3	<2	4,900
TW-3	<1	<1	<1	<2	--	<2	<100
TW-4	***8.3***	<1	1.1	<2	9.4	18.1	<100
S-1	<1	<1	<1	<2	--	<2	<100
S-2	***22.8***	<1	11.5	51	85.3	5.8	650
S-3	<1	<1	<1	<2	--	<2	<100
B-8	1.2	<1	<1	3.6	4.8	25.7	NA
DUP-1	***10,600***	***35,100***	***2,730***	***17,900***	66,330	***2,870***	110,000
Field Blank	<1	<1	<1	<1	--	<2	<100
MCL	5	1,000	700	10,000	--	40 (1)	--

Notes:

MCL - Maximum Contaminant Level promulgated by USEPA.
(1) - Vermont Health Advisory (VHA) standard for MTBE.
All samples were tested using EPA Method 8020 and/or 602 or VOCs and EPA Method 8015M for TPH
Bold and italic numbers indicate concentrations that exceed VGES or VHA standards.
NS - Not sampled. Insufficient water.
FP - Free Product observed in well. Well Not Sampled

job\project\97-03 mg\gwqual.xls\May 30.1997

APPENDIX A

SITE Investigation Report

TWIN STATE ENVIRONMENTAL CORP.
P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477
Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

April 28, 1997

Mr. Bruce Linton
State of Vermont
Sites Management Section
103 South Main Street / West Office
Waterbury, VT 05671-0404

RE: **Mount Mansfield Garage**
Stowe, Vermont
SMS Site #90-0630

Dear Mr. Linton:

Twin State Environmental Corporation (TSEC) has completed preliminary Site Investigation activities at the Mount Mansfield Garage (SITE) in Stowe, Vermont (See SITE Location Map, **Figure 1**, and SITE Plan, **Figure 2**). This portion of the Phase I Environmental Site Assessment (ESA), initiated as part of a real estate transaction, was intended to identify whether past SITE activities have had an adverse effect on the environmental quality of the SITE. The investigation focused on the soil and groundwater quality beneath the SITE.

SUMMARY OF INVESTIGATION

TSEC first conducted a SITE visit on April 4, 1997 in order to plan later SITE investigation activities. During this visit, a petroleum sheen was observed on the brook that borders the western edge of the property. It was noted that the sheen was being released from the retaining wall along the southwest portion of the SITE. A sample of the stream bank sediment was collected and submitted to Endyne, Inc. of Williston, Vermont (Endyne) for volatile organic compound (VOC) analysis by EPA Method 8020, and for Total Petroleum Hydrocarbons (TPH) as gasoline by EPA Method 8015.

On April 9, 1997, TSEC conducted a soil boring program that included seven (7) soil borings; four (4) were converted into monitoring wells, and one (1) was converted into a piezometer. Samples from the soil borings were screened using a photoionization detector (PID) equipped with a 10.6 eV lamp for the presence of VOCs, and one (1) sample from each boring was submitted to TSEC's on-SITE Mobile Laboratory for analysis.

On April 10, 1997, TSEC returned to the SITE to develop the newly installed wells, and to collect groundwater samples from three (3) groundwater monitoring wells on the Bourne's Texaco property (TW-1, TW-2, and TW-3), as well as one (1) groundwater monitoring well on-SITE (MW-1). These samples were analyzed by Endyne for VOCs by EPA Method 8020 and TPH as gasoline by EPA Method 8015 Modified. TSEC also surveyed in all monitoring points at both the SITE and the

both the SITE and the adjacent Texaco property for elevation and location (**Note**: TW-4 was frozen and could not be sampled).

Groundwater samples were also collected from the four (4) newly installed monitoring wells by Envirosense, Inc. (Envirosense) as part of the Phase I ESA. These samples were analyzed by Endyne and will be submitted upon completion of their ESA report.

RESULTS

Sediment Sample Results

The analytical results returned for the Sediment Sample indicate contamination by gasoline. Total BTEX (benzene, toluene, ethylbenzene, and xylenes) concentrations were reported to be 643,400 micrograms per kilogram (ug/kg). TPH as gasoline present in the sample was reported to be 13,000 milligrams per kilogram (mg/kg). Results are presented in **Attachment I,** Sediment Analytical Results.

Soil Sample Results - Mobile Laboratory

During soil boring activities, one (1) sample from within the capillary fringe (12 to 16 ft bgs) of each boring was collected and analyzed for gasoline related compounds (BTEX, MTBE, and Total Gasoline Range Organics). All collected samples were returned with elevated concentrations of gasoline related compounds (see **Table 1**). Total BTEX concentrations ranging from 150 ug/kg to 2,900 ug/kg were reported in borings B-3 and B-2 respectively, and total Gasoline Ranged Organic (GRO) concentrations were reported between 43,000 ug/kg and 260,000 ug/kg in borings B-5 and B-7 respectively. Soil collected from Boring B-5/0-4 ft was reported to contain 270,000 ug/l of GRO, but this sample was collected from above the capillary fringe.

Groundwater Results

Groundwater Flow

Groundwater well elevations were surveyed and depth to groundwater measurements were taken on April 10, 1997. However, due to the relatively short amount of time between well installation and sampling, it is not believed that the elevations are entirely representative of actual SITE conditions. This, in addition to numerous underground disturbances (i.e.-tank cavities, underground drainage features, and backfiling activities on SITE), make it difficult to accurately contour the groundwater across the SITE.

Based on SITE topography and surface drainage in the immediate vicinity of the SITE, combined with observed petroleum sheen releases in the brook, it can be assumed that groundwater is flowing generally from southeast to northwest (See **Figure 3**, Interpreted Groundwater Flow). **Table 2** presents groundwater elevation data for April 10, 1997.

Analytical Results

Groundwater samples collected from the monitoring wells on the Bourne's Texaco Property were returned with total BTEX values ranging from non-detected to 44.9 micrograms per liter (ug/l) , and MTBE values ranging from non-detected to 34.6 ug/l in monitoring wells TW-3 and TW-1 respectively. TPH as gasoline values were reported ranging from non-detected to 7.4 milligrams per liter (mg/l) in monitoring wells TW-3 and TW-2 respectively.

Groundwater collected from the on-SITE monitoring well, MW-1, was returned with no detectable concentrations of BTEX compounds, MTBE, or TPH as gasoline. Complete laboratory analyses are presented in **Attachment II**, Groundwater Analytical Results.

Additional Soil and Groundwater Analyses

Additional samples were collected as part of the Phase I ESA, but are not presented in this report. They will be presented in a report being prepared by Envirosense. Preliminary evaluation of the data, however, indicates total BTEX concentrations in groundwater as high as 88,790 ug/l (MW-101), and MTBE present as high as 5,060 ug/l (MW-107).

CONCLUSIONS

Based on the results of the initial SITE investigation activities, TSEC concludes the following:

- Contaminants are being released into the brook in the vicinity of MW-107, as is evidenced by observed petroleum sheens and elevated concentrations of BTEX and TPH in a sediment sample collected from the brook;
- SITE contains significantly elevated concentrations of gasoline related contaminants as evidenced by mobile laboratory data;
- Groundwater presumably flows towards the brook which is present along the western edge of the SITE; and,
- Contamination is still present at the Bourne's Texaco site that is above standards (TW-1 contains benzene at 44.9 ug/l).

RECOMMENDATIONS

Based on these conclusions, TSEC offers the following professional recommendations.

- An additional round of water level data and water quality samples should be collected from all on-SITE wells (MW-1, MW-2, MW-3, MW-101, MW-103, MW-105, and MW-107) and the wells on

the Bourne's Texaco site (TW-1, TW-2, TW-3, and TW-4). Samples should be analyzed by EPA Method 8020 for BTEX and MTBE, and by EPA Method 8015 Modified for TPH as gasoline.

- Additional monitoring points need to be installed between Mt. Mansfield Garage, Bourne's Texaco, and the brook. A minimum of three (3) points, installed by hand along the brook, would be used to quantify the amount of contamination impacting the brook from the SITE. An additional two (2) wells should be installed between Bourne's Texaco and the brook, along Route 100 (see **Figure 4**, Additional Monitoring Points) to see if any contamination is migrating towards the brook from Bourne's. All points would aid in determining the hydrogeologic characteristics of the SITE.

- A Supplemental SITE Investigation (SSI) should be conducted to determine the nature and extent of the source of the contamination. This investigation should be conducted with identifying potential receptors and corrective action in mind. The brook adjacent to the SITE has been clearly impacted for some time, and it does not appear as though natural attenuation is a viable alternative for SITE cleanup.

Laboratory data collected during the Phase I ESA being conducted by Envirosense will be available upon completion of the report. This data includes soil samples collected from two (2) of the recently advanced soil borings, as well as samples collected from four (4) of the newly installed groundwater monitoring wells.

If you have any questions or concerns, please feel free to give me a call at (802) 434-3350.

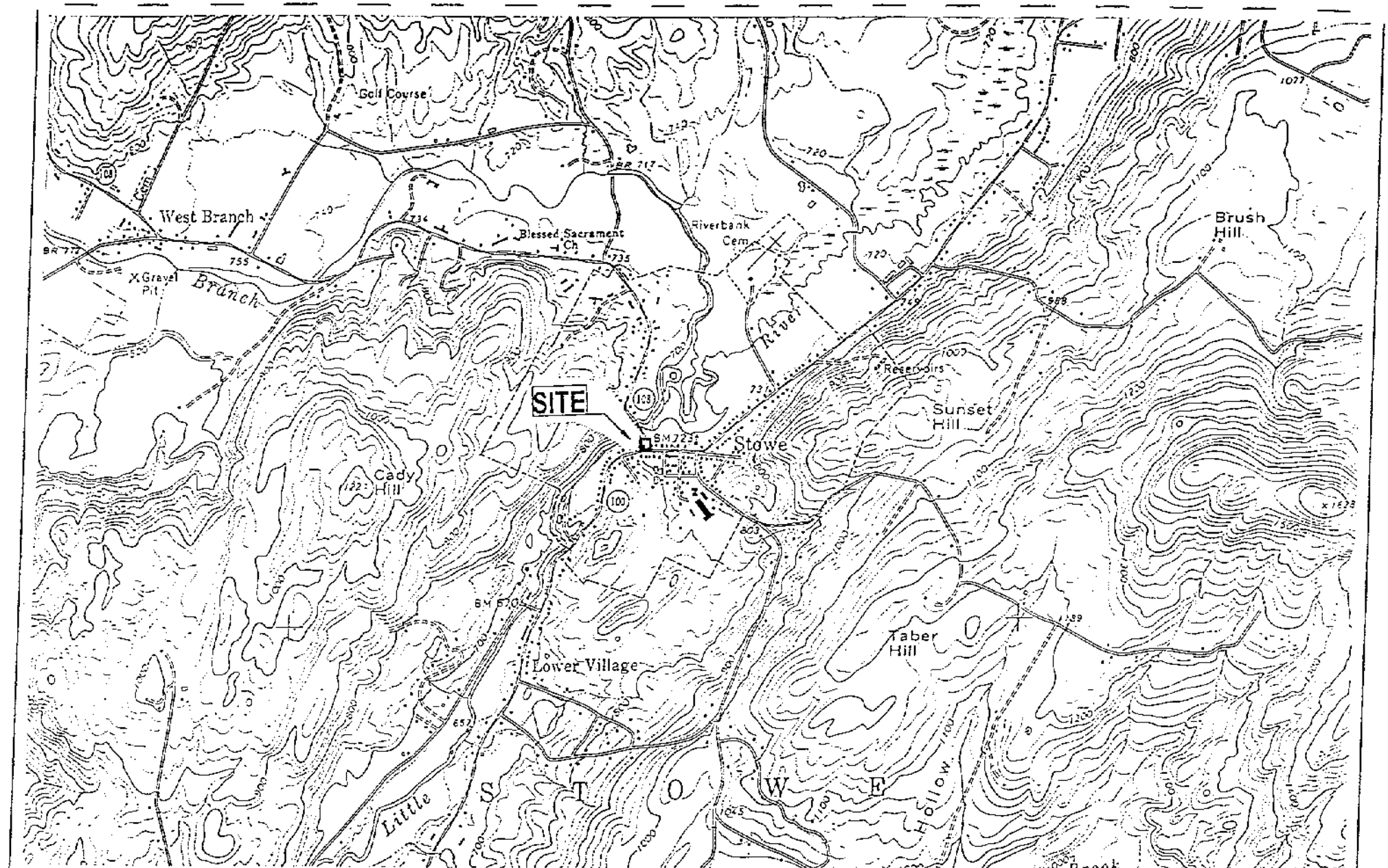
Sincerely,
TWIN STATE ENVIRONMENTAL CORPORATION

Jon Berntsen
Geologist

cc: Mr. Bob Chase, Mt. Mansfield Garage

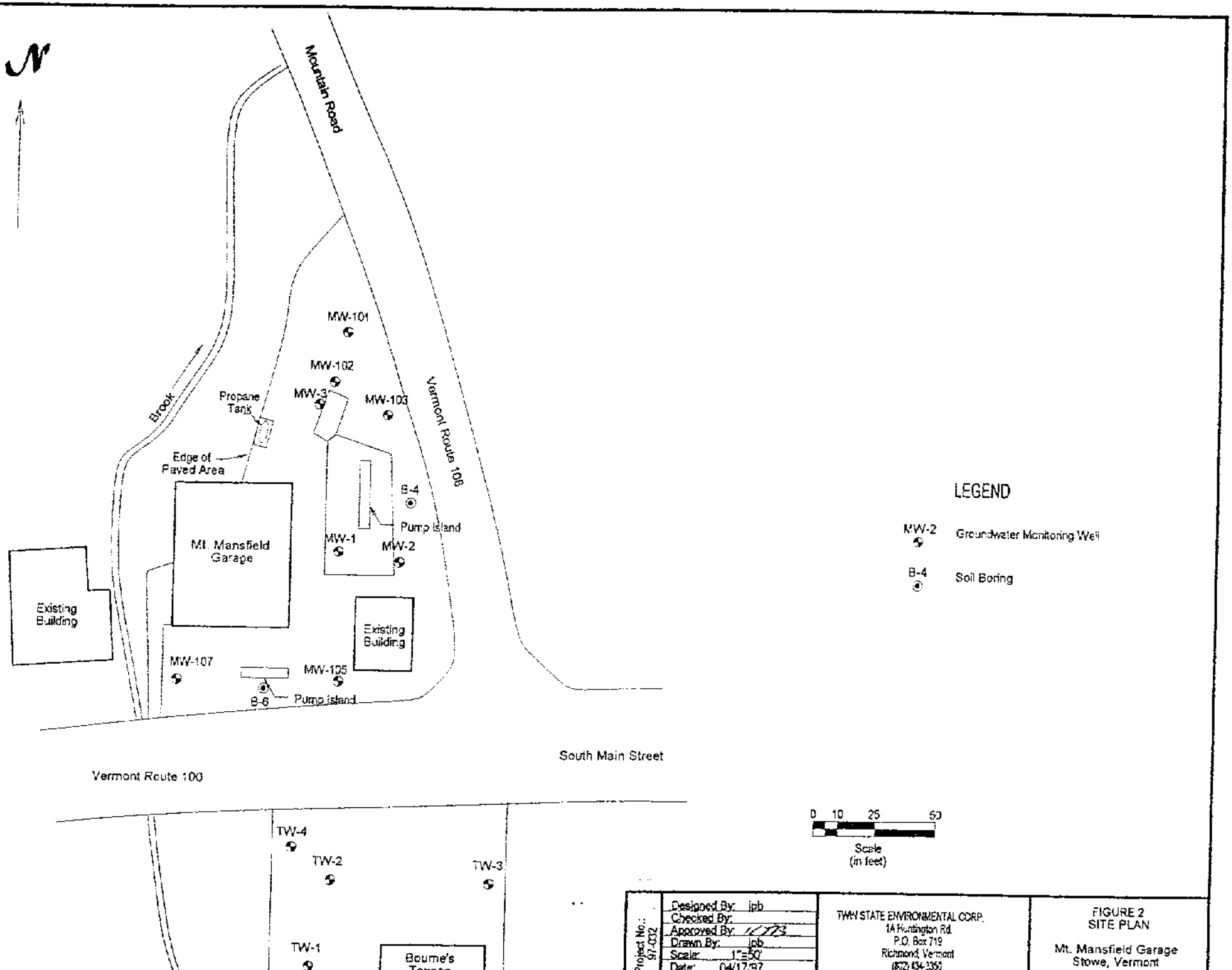
jpb:\project\97-031mg\semirpt.doc

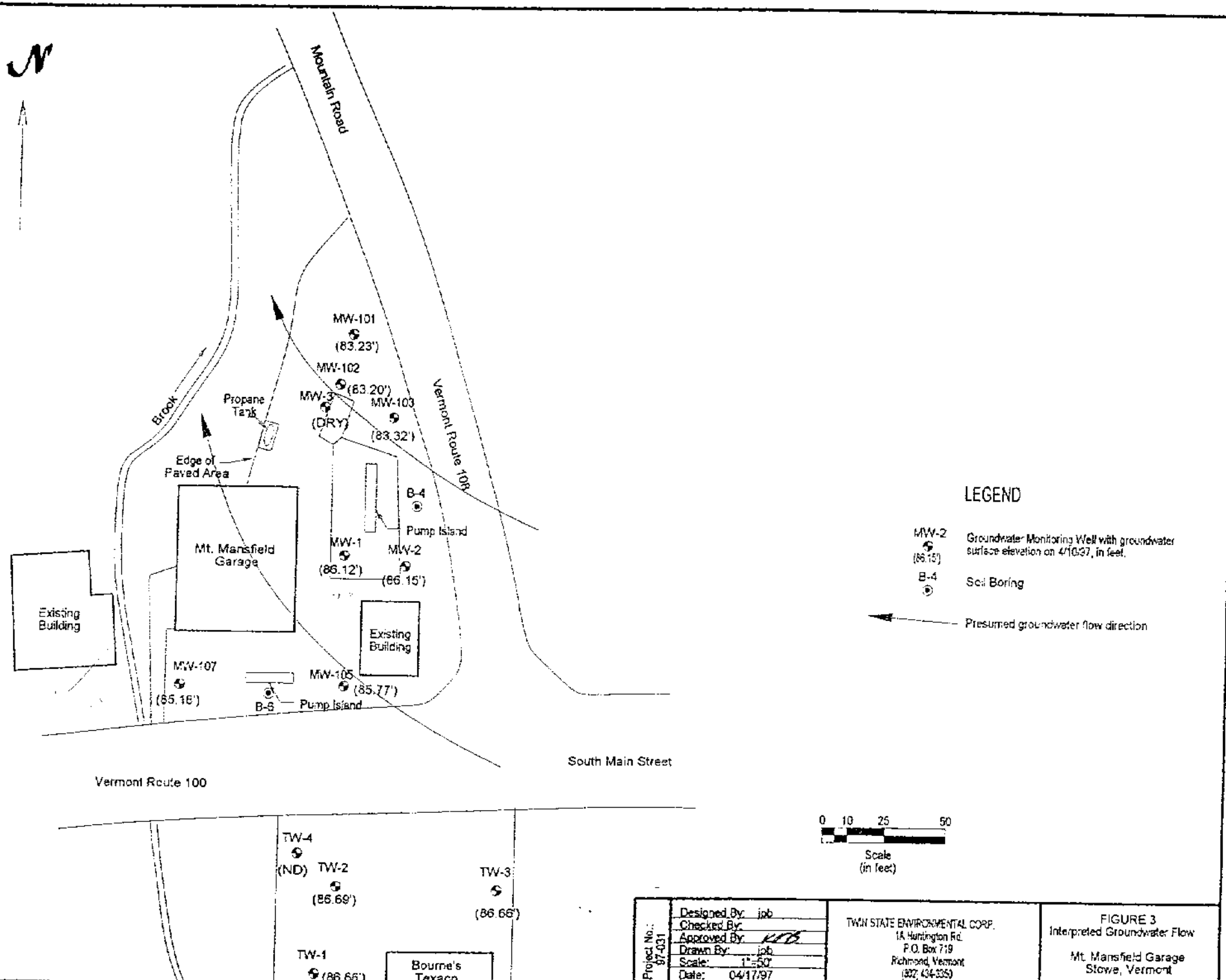
FIGURES

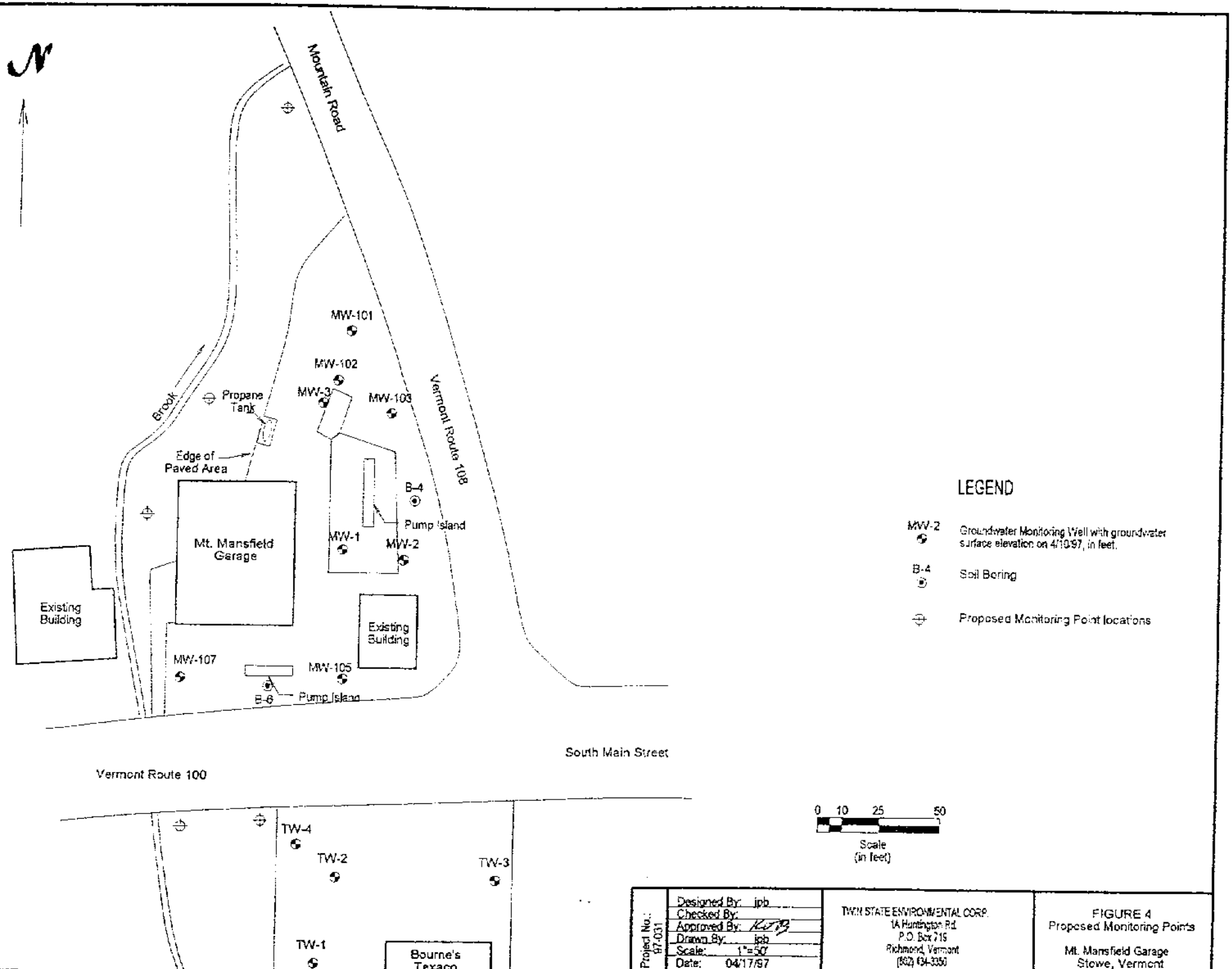


Source: USGS 7.5 Minute Topographic Series
Stowe, Vermont Quadrangle

Project No: 97-031	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: as shown Date: 04/25/97	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3360	FIGURE 1 SITE LOCATION MAP Mt. Mansfield Garage Stowe, Vermont


N
Mountain Road
Vermont Route 108
Brook
Propane Tank
Edge of Paved Area
MW-101
MW-102
MW-3
MW-103
B-4
Pump Island
MW-1
MW-2
Mt. Mansfield Garage
Existing Building
Existing Building
MW-107
MW-105
B-6
Pump Island
South Main Street
Vermont Route 100
TW-4
TW-2
TW-3
TW-1
Bourne's Texaco
LEGEND
MW-2 Groundwater Monitoring Well
B-4 Soil Boring
0 10 25 50
Scale (in feet)
Project No.: 97-032
Designed By: jpb
Checked By:
Approved By:
Drawn By: jpb
Scale: 1"=50'
Date: 04/17/97
TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-3350
FIGURE 2
SITE PLAN
Mt. Mansfield Garage
Stowe, Vermont


N
Mountain Road
Vermont Route 108
Brook
Propane Tank
Edge of Paved Area
MW-101
(83.23')
MW-102
(83.20')
MW-3
(DRY)
MW-103
(83.32')
B-4
Pump Island
Mt. Mansfield Garage
MW-1
(86.12')
MW-2
(86.15')
Existing Building
Existing Building
MW-107
(85.16')
MW-105
(85.77')
B-5
Pump Island
South Main Street
Vermont Route 100
TW-4
(ND)
TW-2
(86.69')
TW-3
(86.66')
TW-1
(86.66')
Bourne's Texaco
LEGEND
MW-2
(86.15')
Groundwater Monitoring Well with groundwater surface elevation on 4/10/97, in feet.
B-4
Soil Boring
Presumed groundwater flow direction
0 10 25 50
Scale
(in feet)
Project No.: 97-031
Designed By: job
Checked By:
Approved By:
Drawn By: job
Scale: 1"=50'
Date: 04/17/97
TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-5355
FIGURE 3
Interpreted Groundwater Flow
Mt. Mansfield Garage
Stowe, Vermont


N
Mountain Road
Vermont Route 108
Brook
Propane Tank
Edge of Paved Area
MW-101
MW-102
MW-3
MW-103
B-4
Pump Island
MW-1
MW-2
Mt. Mansfield Garage
Existing Building
Existing Building
MW-107
MW-105
B-6
Pump Island
South Main Street
Vermont Route 100
TW-4
TW-2
TW-3
TW-1
Bourne's Texaco
LEGEND
MW-2
Groundwater Monitoring Well with groundwater surface elevation on 4/10/97, in feet.
B-4
Soil Boring
Proposed Monitoring Point locations
0 10 25 50
Scale (in feet)
Project No.: 97-031
Designed By: jpb
Checked By:
Approved By:
Drawn By: jpb
Scale: 1"=50'
Date: 04/17/97
TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 215
Richmond, Vermont
(802) 434-3350
FIGURE 4
Proposed Monitoring Points
Mt. Mansfield Garage
Stowe, Vermont

TABLES

Mt. Mansfield Garage
Stowe, Vermont
TSEC Project No. 97-022/97-031

DRAFT

TABLE 1
Twin State Environmental Corporation Mobile Laboratory
Analytical Results
Volatile Organic Compounds by GC/PID/FID
Soil Results in ug/kg

Sample ID	B-1/12-16	B-2/12-16	B-3/12-16	B-5/0-4	B-5/12-16	B-6/0-4	B6/12-16	B-7/12-16	R.L.
Date Sampled	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	
Date Extracted	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	
Date Analyzed	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	04/09/97	
Compound									
Benzene	240	1700	<5.0	810	320	450	150	<5.0	5.0
Toluene	280	250	41	380	510	320	150	310	5.0
Ethylbenzene	<25	280	110	320	<5.0	<5.0	170	<5.0	5.0
Xylenes	590	680	<5.0	<5.0	810	1100	220	1000	5.0
Total BTEX	1100	2900	150	1500	1600	1900	690	1300	--
MTBE	2200	2700	<10	<10	<10	<10	<10	<10	10
GRO	61,000	160,000	160,000	270,000	43,000	60,000	210,000	260,000	

GRO- Gas Ranged Organics quantified from summation of area response of FID and comparing to the area response of a BTEX standard. Resulting concentration is estimated.

TABLE 2

SUMMARY OF GROUNDWATER ELEVATIONS

Mt. Mansfield Garage
Stowe, Vermont

April 10, 1997

Well Identification	Top of Riser Elev.	Depth to Product	Depth to Water	Depth of Well	Thickness of Water Table in Well	Water Table Elev.
MW-1	97.28	ND	11.16	12.68	1.52	86.12
MW-2	97.11	ND	10.96	10.99	0.03	86.15
MW-3	96.11	ND	DRY	11.27	DRY	NA
MW-101	94.93	ND	11.70	16.30	4.60	83.23
MW-102	95.55	ND	12.35	16.00	3.65	83.20
MW-103	95.57	ND	12.25	18.95	6.70	83.32
MW-105	98.42	ND	12.65	15.49	2.84	85.77
MW-107	98.14	ND	12.96	18.00	5.04	85.18
TW-1	99.73	ND	13.07	15.20	2.13	86.66
TW-2	99.40	ND	12.71	15.35	2.64	86.69
TW-3	100.36	ND	13.70	19.55	5.85	86.66
TW-4	98.85	ND	FROZEN	FROZEN	0.00	NA

Notes:

Elevation data are referenced to a TBM and are in units of feet

ND - Not detected.

NA - Not applicable.

Measurements recorded are referenced to a marking on top of PVC riser for each well.

Depth to fluid measurements were obtained using a Solinst Interface Probe.

jpb.\project\97-022mg\wetteb.wb1

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
DATE REPORTED: April 16, 1997
DATE SAMPLED: April 10, 1997

PROJECT CODE: TSEC1725
REF. #: 102,036 - 102,039

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC quidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ATTACHMENT I

SEDIMENT ANALYTICAL RESULTS

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: April 16, 1997
SAMPLER: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

PROJECT CODE: TSEC1725
ANALYSIS DATE: April 15, 1997
STATION: TW-1
REF.#: 102,036
TIME SAMPLED: 1205

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	44.9
Chlorobenzene	1	ND[1]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	34.6

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	84.%
Toluene-d8:	100.%
4-Bromofluorobenzene:	107.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: April 16, 1997
SAMPLER: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

PROJECT CODE: TSEC1725
ANALYSIS DATE: April 15, 1997
STATION: TW-3
REF.#: 102,037
TIME SAMPLED: 1237

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	75.%
Toluene-d8:	94.%
4-Bromofluorobenzene:	108.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: April 16, 1997
SAMPLER: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

PROJECT CODE: TSEC1725
ANALYSIS DATE: April 15, 1997
STATION: ~~TW-1~~ TW-2 (TPB)
REF.#: 102,038
TIME SAMPLED: 1219

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	TBQ[2]
Toluene	1	ND
Xylene	2	8.5
MTBE	2	10.7

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	114.%
Toluene-d8:	92.%
4-Bromofluorobenzene:	105.%

NOTES:

1 None detected
2 Trace below quantitation limit

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: April 16, 1997
SAMPLER: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

PROJECT CODE: TSEC1725
ANALYSIS DATE: April 15, 1997
STATION: F.B.
REF.#: 102,039
TIME SAMPLED: 1100

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	76.%
Toluene-d8:	94.%
4-Bromofluorobenzene:	105.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8015

DATE: April 16, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: Mt. Mansfield Garage
PROJECT CODE: TSEC1726
COLLECTED BY: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

Reference #	Sample ID	Concentration (mg/L)[1]
102,040	TW-1; 1205	TBQ[2]
102,041	TW-3; 1237	ND[3]
102,042	TW-2 ~~TW-4;~~ 1219	7.4
102,043	F.B.; 1100	ND

Notes:

1 Method detection limit is 0.1 mg/L.
2 Trace below quanitation limit
3 None detected

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

TSEC1726

TEXACO

102,036 — 102,043.

CHAIN-OF-CUSTODY RECORD

21185

Project Name: MT. Mansfield Corp Site Location: Stowe, VT	Reporting Address: SAME AS →	Billing Address: 1A Huntington Rd. Richmond, VT 05477
Endyne Project Number: TSEC 1725 97022	Company: Twin State Env. Corp. Contact Name/Phone #: John Diego	Sampler Name: Rod Lindsey Phone #: 802-434-3550

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
102,036	TW-1	L	X		4/10/97 1205	2	40ml VOA	As per John Diego	8020 + Mod TPH 8015	HCL & ICE	
102,037	TW-3	L	X		1237	2		phone conversation			
102,038	~~TW-4~~ TW-2 (DUP)	L	X		1219	2		on 4-14-97 at 2:00pm			
102,039	E.B.	L	X		1100	2		-TMC			

Relinquished by: Signature	Received by: Signature	Date/Time 1547 4/10/97
Relinquished by: Signature	Received by: Signature	Date/Time

5:50

New York State Project: Yes ____ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

TEXACO

CHAIN-OF-CUSTODY RECORD

21185

Project Name: MT. Mansfield Comp Site Location: Stowe, VT	Reporting Address: SAME AS →	Billing Address: 14 Huntington Rd. Richmond VT 05477
Endyne Project Number: 97022	Company: Twin State Analytical Contact Name/Phone #: Jim Duke	Sampler Name: Rod Lindsey Phone #: 802-434-3300

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	TW-1	L	X		1140 97 1205	2	VOA	8020 + 8015M		HCl to pH<2	
	TW-3	L	X		1237	2					
	~~TW-4~~ TW-2 (916)	L	X		1219	2					
	E.B.	L	X		1100	2					

Relinquished by: Signature	Received by: Signature	Date/Time 1547 4/10/97
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ___ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

APR 21 RECD

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
DATE REPORTED: April 16, 1997
DATE SAMPLED: April 10, 1997

PROJECT CODE: TSEC1726
REF. #: 102,040 - 102,043

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

TEXACO

CHAIN-OF-CUSTODY RECORD

21185

Project Name: MT. Mansfield Corner Site Location: Stowe, VT	Reporting Address: SAME AS →	Billing Address: 1A Huntington Rd. Richmond, VT 05477
Endyne Project Number: 97022 TSMC1726	Company: Twin State Gas Corp. Contact Name/Phone #: John Diego	Sampler Name: Rod Lindsey Phone #: 802-434-3300

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
102070	TW-1	L	X		4.10.97 1205	2	40ml VOA	As per John Diego	8020 + MTBE+10 MAJ PEAKS	HCL & ICE	
102071	TW-3	L	X		1237	2		phone conversation			
102072	TW-4 TW-2 4PB	L	X		1219	2		on 4-14-97 at 2:00 pm			
102073	E.B.	L	X		1100	2		-TMC			

Relinquished by: Signature [signature] Received by: Signature [signature] Date/Time 1547 4.10.97 5:50

Relinquished by: Signature Received by: Signature Date/Time

New York State Project: Yes ___ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
DATE REPORTED: April 16, 1997
DATE SAMPLED: April 10, 1997

PROJECT CODE: TSEC1724
REF. #: 102,035

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8015

DATE: April 16, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: Mt. Mansfield Garage
PROJECT CODE: TSEC1724
COLLECTED BY: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

Reference #	Sample ID	Concentration (mg/L)[1]
102,035	MW-1; 1307	ND[2]

Notes:

1 Method detection limit is 0.1 mg/L.
2 None detected

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

Mobil

CHAIN-OF-CUSTODY RECORD

21184

Project Name: MT. MANSFIELD GARAGE Site Location: Stowe, VT	Reporting Address: SAME AS →	Billing Address: 1A Huntington Rd, Richmond, VT 05477
Endyne Project Number: 97022 TSEC 1724	Company: Twin State Env. Corp. Contact Name/Phone #: John Diego	Sampler Name: Rod Lindsay Phone #: 802-434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
132,035	MW-1	L	X		4.10.97 1307	2	40ml VOA	As per John Diego phone conversation on 4-14-97 at 2:00pm —TMC	8020 + Mod TPH 8015	HCL, ice	

Relinquished by: Signature [signature]	Received by: Signature [signature]	Date/Time 1547 4.10.97
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mount Mansfield Garage ESA
DATE REPORTED: April 10, 1997
DATE SAMPLED: April 4, 1997

PROJECT CODE: TSEC1627
REF. #: 101,763

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8015

DATE: April 10, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: Mount Mansfield Garage ESA
PROJECT CODE: TSEC1627
COLLECTED BY: John Diego
DATE SAMPLED: April 4, 1997
DATE RECEIVED: April 4, 1997

Reference #	Sample ID	Concentration (mg/kg)[1]
101,763	Sediment #1; 1330	13,000.

Notes:

1 Method detection limit is 1.0 mg/kg.

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

20354

CHAIN-OF-CUSTODY RECORD

Project Name: Mountmansfield Garage ESA Site Location: Stowe VT	Reporting Address: TSEC PO Box 79 Richmond VT	Billing Address: Same
Endyne Project Number: TSEC1627	Company: TSEC 434/3350 Contact Name/Phone #: John Diego	Sampler Name: Same Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
101763	SEDIMENT #1	Soil	X		4/4/97 1330	1	4oz	STRONG GAS ODOR	8024/8015	4°C	

Relinquished by: Signature [signature] | Received by: Signature [signature] | Date/Time 4-4-97 2:25

Relinquished by: Signature | Received by: Signature | Date/Time

New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

APR 14 REC'

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mount Mainsfield Garage ESA
DATE REPORTED: April 10, 1997
DATE SAMPLED: April 4, 1997

PROJECT CODE: TSEC1626
REF. #: 101,762

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC quidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mount Mansfield Garage
REPORT DATE: April 10, 1997
SAMPLER: John Diego
DATE SAMPLED: April 4, 1997
DATE RECEIVED: April 4, 1997

PROJECT CODE: TSEC1626
ANALYSIS DATE: April 10, 1997
STATION: Sediment #1
REF.#: 101,762
TIME SAMPLED: 1330

Parameter	Detection Limit As Received (ug/kg)[1]	Concentration As Received (ug/kg)
Benzene	2500	TBQ[2]
Chlorobenzene	2500	ND[3]
1,2-Dichlorobenzene	2500	ND
1,3-Dichlorobenzene	2500	ND
1,4-Dichlorobenzene	2500	ND
Ethylbenzene	2500	38,900.
Toluene	2500	64,500.
Xylene	2500	540,000.
MTBE	2500	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	82.%
Toluene-d8:	91.%
4-Bromofluorobenzene:	112.%

PERCENT SOLID: 92.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 0.4% dilution.
2 Trace below quantitation limit
3 None detected

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

20354

CHAIN-OF-CUSTODY RECORD

Project Name: Mount Anthrold Garage ESA Site Location: Stowe VT	Reporting Address: TSEC PO Box 79 Richmond VT	Billing Address: Same
Endyne Project Number: TSEC1626	Company: TSEC 434/3350 Contact Name/Phone #: John Diego	Sampler Name: Same Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
101762	SEDIMENT #1	Soil	X		4/4/97 1330	1	4oz	STRONG GAS ODOR	8020/8015	4°C	

Relinquished by: Signature	Received by: Signature	Date/Time 4-4-97 2:25
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
DATE REPORTED: April 16, 1997
DATE SAMPLED: April 10, 1997

PROJECT CODE: TSEC1723
REF. #: 102,034

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC quidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: April 16, 1997
SAMPLER: Rod Lindsay
DATE SAMPLED: April 10, 1997
DATE RECEIVED: April 10, 1997

PROJECT CODE: TSEC1723
ANALYSIS DATE: April 15, 1997
STATION: MW-1
REF.#: 102,034
TIME SAMPLED: 1307

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	80.%
Toluene-d8:	92.%
4-Bromofluorobenzene:	106.%

NOTES:

1 None detected

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

Mobil

CHAIN-OF-CUSTODY RECORD

102,034 – 102,035

21184

Project Name: MT. MANSFIELD GARAGE Site Location: Stowe, VT	Reporting Address: SAME AS →	Billing Address: 1A Huntington Rd, Richmond, VT 05477
Endyne Project Number: 97022 TSEC1723	Company: Twin State Env. Corp. Contact Name/Phone #: John Diego	Sampler Name: Rod Lindsay Phone #: 802-434-3550

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
102,034	MW-1	L	X		4.10.97 1307	2	40ml VOA	As per John Diego phone conversation on 4-14-97 at 2:00pm -TMC	8020 + Mod PH ROLS	HCL & ice	

Relinquished by: Signature	Received by: Signature	Date/Time 1547 4.10.97 5:50
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ___ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

Mobil

CHAIN-OF-CUSTODY RECORD

21184

Project Name: MT. MANSFIELD GARAGE Site Location: Stowe, VT	Reporting Address: SAME AS ↓	Billing Address: JA Huntington Rd, Richmond, VT 05477
Endyne Project Number: 97022	Company: Twin State Gas & Oil Corp. Contact Name/Phone #: John Diego	Sampler Name: Rod Lindsay Phone #: 802-434-3350

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	MW-1	L	X		4-10-97 1307	2	40ml VOA	8020 & 8015M		HCL & ice	

Relinquished by: Signature	Received by: Signature	Date/Time 1547 4-10-97
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ___ No ___

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrate N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrite N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

APPENDIX B

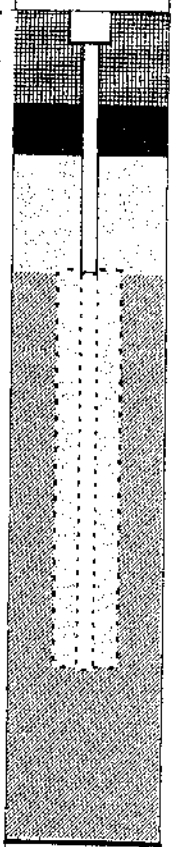
Monitor Well and Boring Logs

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P O Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-101 / B-1	WELL DEPTH:	16.3 ft	BORING DEPTH:	20.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	11.70 ft on April 10, 1997		
PROJECT NO:	97-022	SCREEN DIA:	4x1¼-inch	DEPTH:	6.0-16.0 ft bgs
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	4-inch	DEPTH:	0.5-6.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug		
REMARKS:	Boring B-1 was completed as Monitoring Well MW-101 using a prepacked well screen.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	<1.0	2.0 ft recovery	0.0-0.5: ASPHALT and GRAVEL Base 0.5-0.9: SAND, very fine to medium, little gravel. Fill material. Brown, dry. 0.9-1.0: Cobble 1.0-2.0: SAND, very fine to medium, little gravel. Fill material. Brown, dry.
4		4-8 ft	<1.0	1.5 ft recovery	4.0-5.5: SAND, very fine to medium, little gravel. Brown, dry.
8		8-12 ft	<1.0	1.8 ft recovery	8.0-8.8: SAND, very fine to medium, little gravel. Brown, dry. 8.8-8.9: SILT and Very Fine SAND. Brown. 8.9-9.2: Broken Sandstone cobble. Tan, dry. 9.2-9.8:Sandy SILT w/trace of clay. Moist, grey. Water at 9.7 ft.
12 ▼		12-16 ft	1157	2.0 ft recovery	12.0-13.0: Cave in from above. 13.0-14.0: SAND, fine to medium. Saturated, grey. PHC odor.
16		16-20 ft	2100+ SHEEN	2.6 ft recovery	16.0-17.0:SAND, fine, little silt and clay.Saturated, brown. Sheen. 17.0-18.6: SAND, fine to medium, trace of silt. Grey, saturated. PHC odor.
20					End of Boring = 20.0 feet End of Sampling = 20.0 feet
25					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. Well is located downgradient of UST's.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-102 / B-2	WELL DEPTH: 16.0 ft	BORING DEPTH: 19.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	12.35 ft on April 10, 1997
PROJECT NO:	97-022	SCREEN DIA: 1¼-inch	DEPTH: 6.0-16.0 ft bgs
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC
TSEC REP:	Jon Berntson	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	TSEC	RISER DIA.: 1¼-inch	DEPTH: 0.5-6.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug
REMARKS:	Boring B-2 was completed as Monitoring Well MW-102.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	5.0	2.5 ft recovery	0.0-0.5: ASPHALT and GRAVEL Base 0.5-3.5: SAND, very fine to medium, little gravel. Brown, dry.
1					
2					
3					
4		4-8 ft	<1.0	3.0 ft recovery	4.0-7.0: SAND, very fine to medium, little gravel, some cobbles. Brown, dry.
5					
6					
7					
8		8-12 ft	<1.0	3.1 ft recovery	8.0-9.5: SAND, very fine to medium, little gravel. Brown, dry. 9.5-10.0: Medium SAND (orange/red) 10.0-10.2: Medium and Coarse SAND 10.2-10.5: Medium SAND (orange/red) 10.5-11.0: Medium and Coarse SAND 11.0-11.1: Medium SAND and SILT. Brown, damp.
9					
10					
11					
12		12-16 ft	7386	3.9 ft recovery	12.0-13.2: Medium and Coarse SAND and GRAVEL. Tan, Brown, damp. 13.2-14.0: Silty fine SAND. Grey, tight, saturated. 14.0-14.8: Medium SAND and Silt. Grey, loose, saturated. PHC odor.
13					
14					
15					
16		16-19 ft	2300+ SHEEN	4.0 ft recovery (Core lost at 18-19 feet)	16.0-17.5: Medium SAND, some fine gravel. Heavy PHC Sheen. 17.5-18.0: Fine and Medium SAND. Tan, saturated. 18.0-19.0: SILT. Grey, tight, damp. 19.0-20.0: SAND, SILT, and GRAVEL. Loose, saturated. End of Boring = 19.0 feet End of Sampling = 19.0 feet
17					
18					
19					
20					
21					
22					
23					
24					
25					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; BS BOREHOLE SEAL; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

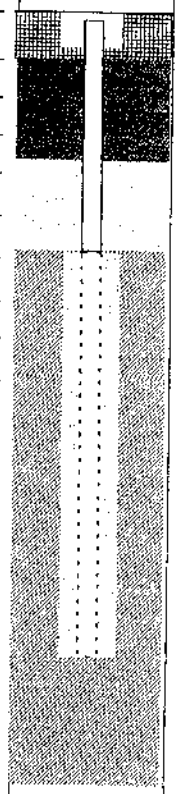
1. Well is located downgradient of USTs.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis.

TWIN STATE ENVIRONMENTAL CORPORATION

14 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-103 / B-3	WELL DEPTH: 19.0 ft	BORING DEPTH: 20.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	12.25 ft on April 10, 1997
PROJECT NO:	97-022	SCREEN DIA: 1¼-inch	DEPTH: 9.0-19.0 ft bgs
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC
TSEC REP:	Jon Bernsen	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	TSEC	RISER DIA.: 1¼-inch	DEPTH: 0.5-9.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug
REMARKS:	Boring B-3 was completed as Monitoring Well MW-103.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	32.0	2.5 ft recovery	0.0-0.5: ASPHALT and GRAVEL Base 0.5-3.5: SAND, very fine to medium, little gravel. Brown, dry.
4		4-8 ft	30.8	2.5 ft recovery	3.5-4.6: SAND, very fine to Medium, little gravel, some cobbles. Brown, dry. 4.6-6.0: Fine and Medium SAND. Grey, dry. 6.0-6.5: Coarse SAND and GRAVEL.
8		8-12 ft	776	2.0 ft recovery	8.0-9.3: SAND, very fine to medium, little gravel. Brown, dry. 9.3-9.5: Fractured cobble. 9.5-10.0: SILT and very fine SAND. Tight, brown
12		12-16 ft	1000+	1.7 ft recovery	12.0-13.0: Medium and Coarse SAND and GRAVEL. Lt. Brown, damp. 13.0-13.7: Medium SAND.
16		16-20 ft	1000+ SHEEN	2.0 ft recovery	16.0-17.9: Medium SAND, some fine gravel. Heavy PID Sheen. 17.0-19.0: SILT. Grey, Light, damp.
20					End of Boring = 19.0 feet End of Sampling = 19.0 feet
25					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER, PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:
1. Well is located adjacent to Route 108.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis.

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P O Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-4	WELL DEPTH:	N/A	BORING DEPTH:	16.0 FT
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	N/A		
PROJECT NO:	97-022	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	N/A		
TSEC REP:	Jon Bernhsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA.:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	N/A		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	N/A		
REMARKS:	Boring B-4 was backfilled with bentonite clay.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0	N	0-4 ft	3.0	Auger through fill	0.0-0.5: ASPHALT and GRAVEL Base 0.5-3.5: SAND, very fine to medium, little gravel. Brown, dry.
1	O				
2					
3	W				
4	E	4-8 ft	<1.0	2.0 ft recovery	4.0-6.0: SAND, very fine to medium, little gravel, some cobbles.
5	L				
6	L				
7					
8	I	8-12 ft	3.0	3.0 ft recovery	8.0-10.5: SAND, medium and coarse. Tan, dry. 10.5-12.0: SILT. Grey, tight, dry.
9	N				
10	S				
11	T				
12	A	12-16 ft	<1.0	4.0 ft recovery	12.0-16.0: SILT. Grey, tight, dry.
13	L				
14	L				
15	E				
16	D				End of Boring = 16.0 feet. End of Sampling = 16.0 feet
17					
18					
19					
20					
21					
22					
23					
24					
25					

LEGEND

- CEMENT GROUT
- NATIVE BACKFILL
- BENTONITE SEAL
- SAND PACK
- WELL SCREEN
- RISER PIPE
- HS HEAD SPACE
- WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

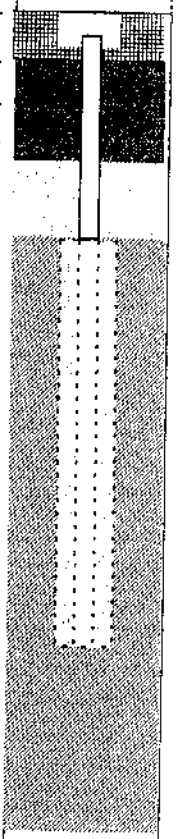
1. Well is located adjacent to Route 108
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis.

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-105 / B-5	WELL DEPTH:	15.5 ft	BORING DEPTH:	20.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	12.65 ft on April 10, 1997		
PROJECT NO:	97-022	SCREEN DIA:	4"x1¼-inch	DEPTH:	5.5-15.5 ft bgs
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	4-inch	DEPTH:	0.5-5.5 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug		
REMARKS:	Boring B-5 was completed as Monitoring Well MW-105 using a prepacked well screen.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	2949	Grab from auger	0.0-0.5: ASPHALT and GRAVEL Base 0.5-4.0: SAND, very fine to medium, little gravel. Fill material. Brown, dry.
4		4-8 ft	708	3.0 ft recovery	4.0-7.0: SAND, very fine to medium, little gravel. Tan, dry.
8		8-12 ft	673	3.5 ft recovery	8.0-8.5: SAND, very fine to medium, little gravel. Brown, dry. 8.5-8.8: Broken cobble. 8.8-11.0: SILT, grey, damp. Heavy PID odor. 11.0-11.9: Broken cobble and SILT.
12		12-16 ft	1500+	2.0 ft recovery	12.0-13.0: SAND, SILT, and GRAVEL. 13.0-14.0: SAND, medium to coarse. Saturated, grey. Heavy PID odor.
16		16-20 ft	1500+	3.0 ft recovery	16.0-19.0: Coarse SAND. Saturated, Tan.. End of Boring = 20.0 feet End of Sampling = 20.0 feet
20					
24					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. Well is located along Route 100, in East driveway.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis.
4. PID was not used on samples from 12-16 and 16-20 due to high levels of contaminants.

TWIN STATE ENVIRONMENTAL CORPORATION

14 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434 4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-6	WELL DEPTH:	N/A	BORING DEPTH:	20.0 FT
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	N/A		
PROJECT NO:	97-022	SCREEN DIA.	N/A	DEPTH:	N/A
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	N/A		
TSEC REP:	Jon Berntsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA.:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe	GUARD TYPE:	N/A		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	N/A		
REMARKS:	Boring B-6 was backfilled with bentonite clay.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0	N	0-4 ft	Not Collected	Auger through fill	0.0-0.5: ASPHALT and GRAVEL Base 0.5-3.5: SAND, very fine to medium, little gravel. Brown, dry.
1	O				
2					
3	W				
4	E	4-8 ft	363	3.0 ft recovery	4.0-4.9: SAND, very fine to medium, little gravel, some cobbles. Tan 4.9-5.0: Broken cobble
5	L				
6	L				5.0-6.0: SAND, fine, and gravel. tan, dry.
7					6.0-7.0: SAND, very fine and fine, and SILT. Tan, dry.
8	I	8-12 ft	1000+	3.0 ft recovery	8.0-9.0: SAND, Medium and little gravel. Brown, dry.
9	N				9.0-9.5: SAND, fine and little gravel. Brown, dry.
10	S				9.5-10.0: Brick
11	T				10.5-11.0: Fine SAND. Brown, damp.
12	A	12-16 ft	1000+	3.5 ft recovery	12.0-12.5: Medium and Coarse SAND and GRAVEL. Brown, damp.
13	L				12.5-13.5: Fine SAND and SILT saturated.
14	L				13.5-14.6: Medium SAND.
15	E				14.6-15.0: Coarse SAND. 15.0-15.5: Medium SAND. Strong PEC odor.
16	D	16-19 ft	1000+	4.0 ft recovery	16.0-18.0: Coarse SAND.
17					
18					18.0-19.5: Fine and Medium SAND. Tan, saturated.
19					19.5-20.0: SILT. Grey, Light, damp.
20					
21					End of Boring = 20.0 feet End of Sampling = 20.0 feet
22					
23					
24					
25					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

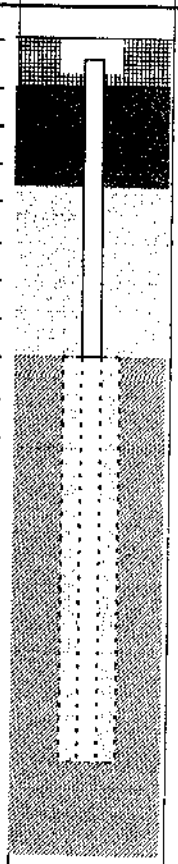
1. Well is located adjacent to pump island, Route 100 side.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis.

TWIN STATE ENVIRONMENTAL CORPORATION

14 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-107 / B-7	WELL DEPTH:	18.0 ft	BORING DEPTH:	20.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	12.96 ft. on April 10, 1997		
PROJECT NO:	97-022	SCREEN DIA:	½x1½-inch	DEPTH:	8.0-18.0 ft bgs
INSTALL DATE:	April 9, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Bernlsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	½-inch	DEPTH:	0.5-8.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug		
REMARKS:	Boring B-7 was completed as Monitoring Well MW-107 using a prepacked well screen.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	11.2	Auger through fill	0.0-0.5: ASPHALT and GRAVEL Base 0.5-4.0: SAND, very fine to medium,
4		4-8 ft	11.5	3.25 ft recovery	4.0-4.25: SAND, very fine to medium, little gravel. Brown, dry.
8		8-12 ft	52	2.0 ft recovery	8.0-8.5: Fine to medium GRAVEL. Grey, dry. 8.5-9.8: Medium SAND. Tan. 9.8-10.2: Broken Sandstone cobble. Tan, dry.
12		12-16 ft	452	3.0 ft recovery	12.0-13.0: Fine to very fine SAND. Little gravel, little silt. 13.0-14.5: SILT and very fine SAND. 14.5-15.0: Very fine, silty SAND. Strong PHC odor. Damp.
16		16 20 ft	358	3.0 ft recovery	16.0-18.0: SAND, medium to coarse, little fine sand. Saturated, brn. 18.0-19.0: SILT. Grey, wet. PHC odor.
20					End of Boring - 20.0 feet End of Sampling = 20.0 feet

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX.)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. Well is located along Route 100, adjacent to brook.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
3. Sample from 12-16' submitted to TSEC Mobile Lab for analysis.

TWIN STATE ENVIRONMENTAL CORPORATION

14A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-8	WELL DEPTH: 18.0 ft	BORING DEPTH: 20.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	12.96 ft on April 10, 1997
PROJECT NO:	97-031	SCREEN DIA: 2x1½-inch	DEPTH: 8.0-18.0 ft bgs
INSTALL DATE:	May 23, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC
TSEC REP:	Jon Bernlsen	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	TSEC	RISER DIA.: 2-inch	DEPTH: 0.5-8.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug
REMARKS:			

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0	N	0-4 ft	<1	3.0 ft recovery	0.0-0.5: ASPHALT and GRAVEL Base 0.5-1.0: SAND, fine to medium, and gravel. Dry. 1.0-2.5: SAND and GRAVEL. Dry 2.5-3.0: SAND, fine to very fine; little fine gravel. Brown, dry. 4.0-7.0: SAND, very fine to medium, little gravel. Brown, dry.
1	O				
2					
3	W				
4	E	4-8 ft	<1	3.0 ft recovery	
5	L				
6	L				
7					
8	I	8-12 ft	<1	3.0 ft recovery	8.0-9.0: SAND, very fine to medium, little gravel. Brown, dry. 9.0-10.2: SAND, fine, and SILT. Brown, Dry. 10.2-10.5: Wood fragment. 10.5-10.75: SILT. Brown, dry. 10.75-11.0: SAND, medium to coarse. Dry, gray.
9	N				
10	S				
11	T				
12	A	12-16 ft	571	2.5 ft recovery	12.0-12.5: SAND, medium to coarse, with some gravel. 12.5-13.5: SILT and very fine SAND. 13.5-13.75:Coarse SAND layer. Dry 13.75-14.5: SAND, fine to medium. Damp, tan.
13	L				
14 ▼	L				
15	E				
16	D	16-20 ft	28.6	4.0 ft recovery	16.0-18.0:Cave in- Materials from above. 18.0-18.5: Fine to medium SAND. 18.5-19.0: Fine SAND and SILT. 19.0-20.0: Coarse SAND. Tan, saturated.
17					
18					
19					
20					End of Boring = 20.0 feet End of Sampling = 20.0 feet.
21					
22					
23					
24					
25					

LEGEND

- CEMENT GROUT
- NATIVE BACKFILL
- BENTONITE SEAL
- SAND PACK
- WELL SCREEN
- RISER PIPE
- HS HEAD SPACE
- WATER LEVEL
- BACKFILL

GRANULAR SOILS BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. Boring is located along Route 100, in front of Stowe Water and Light Department.
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-109 / B-9	WELL DEPTH:	16.2 ft	BORING DEPTH:	24.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	11.66 ft on May 30, 1997		
PROJECT NO:	97-031	SCREEN DIA:	4x1¼-inch	DEPTH:	6.2-16.2 ft bgs
INSTALL DATE:	May 23, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Bernsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	4-inch	DEPTH:	0.5-8.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug		
REMARKS:	Boring B-9 was completed as Monitoring Well MW-109 using a prepacked well screen.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	<1	3.0 ft recovery	0.0-0.5: ASPHALT and GRAVEL Base
1					0.5-1.0: SAND, fine to medium, and gravel. Dry.
2					1.0-2.5: SAND and GRAVEL. Dry
3					2.5-3.0: SAND, fine to very fine; little fine gravel. Brown, dry.
4		4-8 ft	<1	2.0 ft recovery	4.0-4.5: SAND, very fine to medium, little gravel. Brown, dry.
5					4.5-5.2: Silty SAND and gravel. Dry, brown.
6					5.2-6.0: Broken rock fragment with some fine silty sand. Dry.
7					
8		8-12 ft	<2	1.5 ft recovery	8.0-8.2: Medium SAND. Tan, dry.
9					8.2-8.9: Fine and very fine SAND.
10					8.9-9.5: Fine to medium SAND with broken gravel.
11					
12		12-16 ft	13.0	3.0 ft recovery	12.0-14.0: Fine to coarse SAND with some gravel.
13					14.0-15.0: Medium SAND. Tan, saturated at 14.5'.
14					
15					
16		16-20 ft	2.8	3.5 ft recovery	16.0-17.0: SAND, medium to coarse and silt. Saturated, brn.
17					17.0-18.5: SAND, medium to very coarse, with some coarse gravel.
18					18.5-19.5: SAND, medium. Tan, saturated
19					
20		20-24 ft	No PID	3.0 ft recovery	20.0-21.0: Medium to coarse SAND with fine gravel.
21					21.0-23.0: Medium to coarse SAND. Tan/brown, saturated. No odor.
22					
23					
24					End of Boring = 24.0 feet
25					End of Sampling = 24.0 feet

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. Well is located along Route 100, west of the Stowe Water and Light Department
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.

TWIN STATE ENVIRONMENTAL CORPORATION

1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3330 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	MW-110 / B-10	WELL DEPTH: 23.2 ft	BORING DEPTH: 24.0 ft
PROJECT NAME:	Mt. Mansfield Garage	DEPTH TO WATER:	13.35 ft on May 30, 1997
PROJECT NO:	97-033	SCREEN DIA: ½x1½-inch	DEPTH: 13.2-23.2 ft bgs
INSTALL DATE:	May 23, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC
DRILLING CO:	TSEC	RISER DIA.: ½-inch	DEPTH: 0.5-8.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Expansion Plug
REMARKS:	Boring B-10 was completed as Monitoring Well MW-110 using a prepacked well screen.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4 ft	No PID	No Recovery	3" recovery in sample tube. Materials to 3" are silty fine to medium sand.
4		4-8 ft	12.4	1.0 ft recovery	4.0-5.0: SAND, SILT, and GRAVEL fill. Brown, dry.
8		8-12 ft	790	2.0 ft recovery	8.0-12.0: SAND, SILT, and GRAVEL fill. Brown, dry.
12		12-16 ft	No PID	4.0 ft recovery	12.0-15.5: SAND, SILT, and GRAVEL fill. Brown, dry. 15.5-16.0: Coarse SAND. Saturated, heavy PHC odor.
16		16-20 ft	No PID	4.0 ft recovery	16.0-20.0: Silty coarse SAND and GRAVEL. Black. Heavy PHC odor.
20		20-24 ft	No PID	2.0 ft recovery	20.0-21.5: Coarse SAND with fine gravel. 21.5-22.0: Silty grey clay. Saturated. Heavy PHC odor.
24					End of Boring = 24.0 feet End of Sampling = 24.0 feet

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROX)

GRANULAR SOILS	
BLOWS/FT	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	M.DENSE
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT	DENSITY
<2	V.SOFT
2-4	SOFT
4-8	M.STIFF
8-15	STIFF
15-30	V.STIFF
>30	HARD

PROPORTIONS USED	
TRACE	0-10%
LITTLE	10-20%
SOME	20-35%
AND	35-50%

NOTES:

1. Well is located at southwest corner of Mt. Mansfield Garage
2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.

APPENDIX C

Laboratory Analytical Reports

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: May 30, 1997
DATE SAMPLED: May 23, 1997

PROJECT CODE: TSEC1391
REF.#: 104,339

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

JUN 03 REC'D
DATE _____
PROJECT # _____
EXPENSE _____
APPROVAL _____

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
CLIENT PROJ. #: N1

DATE RECEIVED: May 27, 1997
REPORT DATE: May 30, 1997
PROJECT CODE: TSEC1391

Ref. #:	104,339				
Site:	B-8				
Date Sampled:	5/23/97				
Time Sampled:	10:00				
Sampler:	Jon Berntsen				
Date Analyzed:	5/30/97				
UIP Count:	>10				
Dil. Factor (%):	100				
Surr % Rec. (%):	90				
Parameter	**Conc. (ug/L)**				
Benzene	1.2				
Chlorobenzene	<1				
1,2-Dichlorobenzene	<1				
1,3-Dichlorobenzene	<1				
1,4-Dichlorobenzene	<1				
Ethylbenzene	<1				
Toluene	TBQ <1				
Xylenes	3.6				
MTBE	25.7				

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC.
32 James Brown Drive
W liston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

21295

Project Name: MT. MANSFIELD GARAGE Site Location: STOWE, VT	Reporting Address: P.O. BOX 719 RICHMOND VT 05477	Billing Address: P.O. BOX 719 RICHMOND VT 05477
Endyne Project Number: TSEC1391	Company: TSEC Contact Name/Phone #: JON BERGESON (802) 434-3350	Sampler Name: JON BERGESON Phone #: (802) 434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
10439	G-8	WATER	✓		5/23/97 1000	2	40 ml y/c	[redacted]	8070+MTBE		
								AIR IN ONE SAMPLE (INCIDENTAL)			

Relinquished by: Signature [signature] Received by: Signature [signature] Date/Time 5/27/97 12:17

Relinquished by: Signature [signature] Received by: Signature [signature] Date/Time 5/27/97 1:45

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

JUN 13 REC'D

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
DATE REPORTED: June 11, 1997
DATE SAMPLED: May 30, 1997

PROJECT CODE: TSEC1465
REF. #: 104,690 - 104,708

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-109
REF.#: 104,690
TIME SAMPLED: 1350

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	1.7
Chlorobenzene	1	ND[1]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	3.2

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	82.%
Toluene-d8:	99.%
4-Bromofluorobenzene:	100.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-114
REF.#: 104,691
TIME SAMPLED: 1253

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	98.%
Toluene-d8:	100.%
4-Bromofluorobenzene:	99.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-107
REF.#: 104,692
TIME SAMPLED: 1150

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	100	13,400.
Chlorobenzene	100	ND[2]
1,2-Dichlorobenzene	100	ND
1,3-Dichlorobenzene	100	ND
1,4-Dichlorobenzene	100	ND
Ethylbenzene	100	2,310.
Toluene	100	15,700.
Xylene	200	11,900.
MTBE	200	5,210.

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	101.%
Toluene-d8:	109.%
4-Bromofluorobenzene:	96.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 1.% diltion.
2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-105
REF.#: 104,693
TIME SAMPLED: 1240

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	50	695.
Chlorobenzene	50	ND[2]
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	765.
Toluene	50	2,730.
Xylene	100	5,250.
MTBE	100	196.

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	98.%
Toluene-d8:	105.%
4-Bromofluorobenzene:	101.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 2.% dilution.

2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-110
REF.#: 104,694
TIME SAMPLED: 1210

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	5	282.
Chlorobenzene	5	ND[2]
1,2-Dichlorobenzene	5	ND
1,3-Dichlorobenzene	5	ND
1,4-Dichlorobenzene	5	ND
Ethylbenzene	5	69.8
Toluene	5	56.4
Xylene	10	931.
MTBE	10	119.

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	98.%
Toluene-d8:	103.%
4-Bromofluorobenzene:	99.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 20.% diltuion.
2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-1
REF.#: 104,695
TIME SAMPLED: 1228

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 6

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	99.%
Toluene-d8:	97.%
4-Bromofluorobenzene:	101.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-103
REF.#: 104,696
TIME SAMPLED: 1255

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	1000	6,650.
Chlorobenzene	1000	ND[2]
1,2-Dichlorobenzene	1000	ND
1,3-Dichlorobenzene	1000	ND
1,4-Dichlorobenzene	1000	ND
Ethylbenzene	1000	5,600.
Toluene	1000	70,900.
Xylene	2000	38,700.
MTBE	2000	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	101.%
Toluene-d8:	97.%
4-Bromofluorobenzene:	98.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 0.1% dilution.

2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-101
REF.#: 104,697
TIME SAMPLED: 1325

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	500	10,200.
Chlorobenzene	500	ND[2]
1,2-Dichlorobenzene	500	ND
1,3-Dichlorobenzene	500	ND
1,4-Dichlorobenzene	500	ND
Ethylbenzene	500	2,560.
Toluene	500	32,200.
Xylene	1000	16,400.
MTBE	1000	2,910

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	99.%
Toluene-d8:	99.%
4-Bromofluorobenzene:	99.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 0.2% dilution.
2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-112
REF.#: 104,698
TIME SAMPLED: 1315

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	20	205.
Chlorobenzene	20	ND[2]
1,2-Dichlorobenzene	20	ND
1,3-Dichlorobenzene	20	ND
1,4-Dichlorobenzene	20	ND
Ethylbenzene	20	52.8
Toluene	20	42.6
Xylene	40	322.
MTBE	40	91.4

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	95.%
Toluene-d8:	102.%
4-Bromofluorobenzene:	99.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 5.% dilution.
2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: FB
REF.#: 104,699
TIME SAMPLED: 1200

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	94.%
Toluene-d8:	97.%
4-Bromofluorobenzene:	99.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: MW-113
REF.#: 104,700
TIME SAMPLED: 1224

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	38.0

NUMBER OF UNIDENTIFIED PEAKS FOUND: 3

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	101.%
Toluene-d8:	106.%
4-Bromofluorobenzene:	100.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: TW-1
REF.#: 104,701
TIME SAMPLED: 1118

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	47.5
Chlorobenzene	1	ND[1]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	9.3
Toluene	1	10.5
Xylene	2	35.4
MTBE	2	29.5

NUMBER OF UNIDENTIFIED PEAKS FOUND: 5

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	107.%
Toluene-d8:	109.%
4-Bromofluorobenzene:	98.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: TW-2
REF.#: 104,702
TIME SAMPLED: 1133

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	8.3
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	99.%
Toluene-d8:	104.%
4-Bromofluorobenzene:	97.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 9, 1997
STATION: TW-3
REF.#: 104,703
TIME SAMPLED: 1153

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	108.%
Toluene-d8:	105.%
4-Bromofluorobenzene:	102.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 10, 1997
STATION: TW-4
REF.#: 104,704
TIME SAMPLED: 1213

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	8.3
Chlorobenzene	1	ND[1]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	1.1
Toluene	1	ND
Xylene	2	TBQ[2]
MTBE	2	18.1

NUMBER OF UNIDENTIFIED PEAKS FOUND: 4

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	115.%
Toluene-d8:	102.%
4-Bromofluorobenzene:	103.%

NOTES:

1 None detected
2 Trace below quantitation limit

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 10, 1997
STATION: S-1
REF.#: 104,705
TIME SAMPLED: 1410

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	97.%
Toluene-d8:	98.%
4-Bromofluorobenzene:	97.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 10, 1997
STATION: S-2
REF.#: 104,706
TIME SAMPLED: 1420

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	22.8
Chlorobenzene	1	ND[1]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	11.5
Toluene	1	TBQ[2]
Xylene	2	51.0
MTBE	2	5.8

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	100.%
Toluene-d8:	106.%
4-Bromofluorobenzene:	98.%

NOTES:

1 None detected
2 Trace below quantitation limit

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 10, 1997
STATION: S-3
REF.#: 104,707
TIME SAMPLED: 1423

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylene	2	ND
MTBE	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 9

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	99.%
Toluene-d8:	102.%
4-Bromofluorobenzene:	99.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
REPORT DATE: June 11, 1997
SAMPLER: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

PROJECT CODE: TSEC1465
ANALYSIS DATE: June 10, 1997
STATION: Dup-1
REF.#: 104,708
TIME SAMPLED: 1115

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	50	10,600.
Chlorobenzene	50	ND[2]
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	2,730.
Toluene	50	35,100.
Xylene	100	17,900.
MTBE	100	2,870.

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	106.%
Toluene-d8:	105.%
4-Bromofluorobenzene:	101.%

NOTES:

1 Detection limit increased due to high levels of contaminants. Sample run at a 0.2% dilution.
2 None detected

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

TSEC1466

CHAIN-OF-CUSTODY RECORD

104,690 — 104,727

21299

Project Name: MT MANSFIELD GARAGE Site Location: STOWE VT	Reporting Address: P.O. Box 719 RICHMOND, VT 05477	Billing Address: SAME AS ←
Endyne Project Number: TSEC1465	Company: TSEC Contact Name/Phone #: JON BERNTSEN 434-3350	Sampler Name: BRIAN WAGNER / JON BERNTSEN Phone #: 434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
104,690	MW-109	WATER	X		5/30/97 1330	2	40ml VOA	BTEX+MTBE 8015M TPH as GAS	←	HCl	NO
104,691	MW-114				1253						
104,692	MW-107				1150						
104,693	MW-105				1240						
104,694	MW-110				1210						
104,695	MW-1				1228						
104,696	MW-103				1255						
104,697	MW-101				1325						
104,698	MW-112				1315						
104,699	FB				1200						

Relinquished by: Signature Jon Bern	Received by: Signature	Date/Time 5/30/97 5:30
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

21296

Project Name: MT. MANSFIELD GARAGE Site Location: STOWE VT	Reporting Address: P.O. BOX 719 RICHMOND, VT 05477	Billing Address: SAME ← AS
Endyne Project Number: TSEC 1465	Company: TSEC Contact Name/Phone #: JAN BERNTSEN 434-3350	Sampler Name: BRIAN WAGNER / JAN BERNTSEN Phone #: 802-434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
104,700	MW-113	Water	X		5/30/97 1224	2	40ml/VOA	8020+MTBE, 8015M-TPH(DRO) RD 5/30	←	HCL	NO
104,701	TW-1				1118						
104,702	TW-2				1133						
104,703	TW-3				1153						
104,704	TW-4		↓		1213						
104,705	S-1				1410			602+MTBE			
104,706	S-2				1420			↓			
104,707	S-3				1423						
104,708	DUP-1	↓	↓		1115	↓	↓	8020+MTBE		↓	↓

Relinquished by: Signature Jan Bern	Received by: Signature	Date/Time 5/30/97 5:30
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Mt. Mansfield Garage
DATE REPORTED: June 11, 1997
DATE SAMPLED: May 30, 1997

PROJECT CODE: TSEC1466
REF. #: 104,709 - 104,727

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT
TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8015

DATE: June 11, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: Mt. Mansfield Garage
PROJECT CODE: TSEC1466
COLLECTED BY: B. Wagner/J. Berntsen
DATE SAMPLED: May 30, 1997
DATE RECEIVED: May 30, 1997

Reference #	Sample ID	Concentration (mg/L)[1]
104,709	MW-109; 1350	ND[2]
104,710	MW-114; 1253	ND
104,711	MW-107; 1150	137.
104,712	MW-105; 1240	61.5
104,713	MW-110; 1210	10.3
104,714	MW-1; 1228	TBQ[3]
104,715	MW-103; 1255	158.
104,716	MW-101; 1325	96.0
104,717	MW-112; 1315	6.36
104,718	FB; 1200	ND
104,719	MW-113; 1224	TBQ
104,720	TW-1; 1118	0.42
104,721	TW-2; 1133	4.90
104,722	TW-3; 1153	ND
104,723	TW-4; 1213	TBQ
104,724	S-1; 1410	ND
104,725	S-2; 1420	0.65
104,726	S-3; 1423	TBQ
104,727	Dup-1; 1115	110.

Notes:

1 Method detection limit is 0.1 mg/L.
2 None detected
3 Trace below quantitation limit

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

21299

Project Name: MT MANSFIELD GARAGE Site Location: STOWE VT	Reporting Address: P.O. Box 719 RICHMOND, VT 05477	Billing Address: SAME AS ←
Endyne Project Number: TSEC1466	Company: TSEC Contact Name/Phone #: JON BERNTSEN 434-3350	Sampler Name: BRIAN WAGNER/JON BERNTSEN Phone #: 434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
104,709	MW-109	WATER	X		5/30/97 1350	2	40ml VOA	8020+MTBE, 8015M TPH-AS GAS	←	HCl	NO
104,710	MW-114				1253						
104,711	MW-107				1150						
104,712	MW-105				1240						
104,713	MW-110				1210						
104,714	MW-1				1228						
104,715	MW-103				1255						
104,716	MW-101				1325						
104,717	MW-112				1315						
104,718	FB	↓	↓		↓ 1200	↓	↓	↓			

Relinquished by: Signature Jon Bern	Received by: Signature	Date/Time 5/30/97 5:30
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify)										

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

21296

Project Name: MT MANSFIELD GARAGE Site Location: STOWE VT	Reporting Address: P.O. BOX 719 RICHMOND VT 05477	Billing Address: SAME ← A/P
Endyne Project Number: TSEC1466	Company: TSEC Contact Name/Phone #: JON BERNTSEN 434-3350	Sampler Name: BRIAN WAGNER / JON BERNTSEN Phone #: 802-434-3350

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
104,719	MW-113	Water	X		5/30/97 1224	2	40 ml/VOA	8020+MTBE, 8015M-TPH (NS GAS)	←	VOC	NO
104,720	TW-1				1118						
104,721	TW-2				1133						
104,722	TW-3				1153						
104,723	TW-4		↓		1213						
104,724	S-1				1410			602 +MTBE			
104,725	S-2				1420			↓			
104,726	S-3				1423			↓			
104,727	DUP-1	↓	↓		1115	↓	↓	8020 +MTBE ↓		↓	↓

Relinquished by: Signature Jon Bernt	Received by: Signature	Date/Time 5/30/97 5:30
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										